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Date August 1982

From Chief, Research and Evaluation Staff
Health Education Division
Center for Health Promotion and Education

Subject Administrative Reviews and Critique of the Preliminary Version of "A Program Evaluation Handbook for Health Education Programs in Immunization"

To American Public Health Association Workshop Attendees
CDC-Workshop Attendees

The attached preliminary document is for your technical review and comment only. Questions and suggestions regarding this report should be addressed to me at the following address:

Centers for Disease Control
Center for Health Promotion and Education
Health Education Division
Atlanta, Georgia 30333

Walter J. Gunn
Walter J. Gunn, Ph.D.

Attachment

READEX FICHE

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(PRELIMINARY VERSION*)

A PROGRAM EVALUATION HANDBOOK
FOR
HEALTH EDUCATION PROGRAMS
IN
IMMUNIZATION

for the

CENTERS FOR DISEASE CONTROL
Center for Health Promotion and Education
Atlanta, Georgia 30333

by

IOX Assessment Associates
Culver City, California 90230

Contract No. 200-81-0622

August 1982

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* This handbook contains measures which have not yet been subjected to empirical verification. A subsequent project to validate the measures for use in health education programs is planned.

PREFACE

In recent years health educators have increasingly recognized the potential of systematic evaluation as a means to both appraise and improve their programs. For this potential to be realized, however, an effective mechanism for gathering relevant data is required. Until now, there have been instances where critical information about a program's effects has not been collected because of a lack of suitable measuring devices for gauging program effects. This handbook was prepared to rectify, at least in part, this deficiency in the evaluation of health education programs in immunizations.

More specifically, in 1980 the United States Centers for Disease Control (CDC) initiated a project to prepare seven collections of measuring devices which could be used by health educators to evaluate their programs. The measures were to be assembled in handbooks which would serve as resources for those wishing to evaluate health education programs in the various fields.[1] The materials contained in the following pages constitute the handbook of evaluation measures for the field of immunization.

In essence, the project's architects hoped to provide health educators with a range of measurement devices that could serve as possible tools for the evaluation of a particular program. This "menu" of potentially relevant assessment instruments was expected to facilitate the assembly of evidence regarding a given program's effects.

This handbook is not intended to be prescriptive. Those involved in evaluating immunization programs should regard the handbook only as a resource, that is, a repository of assessment tools which may be of use. The extent to which the handbook is actually useful depends, in large part, on the extent to which there is a correspondence between the intended impact of a given health education program and the outcomes which are assessed by the measures in the handbook.

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[1] The seven handbooks focused on the following areas: alcohol and substance abuse, diabetes, exercise, immunization, nutrition, smoking, and stress management. Information regarding the availability of the handbooks is available from the Centers for Disease Control.

A Capsule History of the Handbook's Creation

The development of this handbook was conducted by an external contractor, selected competitively on the basis of responses to a CDC-issued request for proposals. The contractor was to collect and develop evaluation measures for critical behavioral, knowledge, skill, and affective outcomes in the area of immunization. A panel of experts was selected to guide the contractor in determining which outcomes were important enough to immunization health education programs to require assessment devices. Three members of the panel were subject matter specialists. These experts were selected on the basis of suggestions from prominent national associations with a primary mission in immunization. Nominations were screened to ensure the creation of a panel with a balanced view of the field. So, for example, at least one of the experts represented a national association and at least one possessed direct community level experience in administering local health education programs in immunization.

In addition to these three subject matter experts, a fourth member of the expert panel was a health education generalist. Nominations for the health educator were solicited from national health education associations. Two specialists in evaluation and testing were also members of the expert panel. Additional subject matter experts representing interested national associations were also invited to serve as panelists. The names and affiliations of the expert panelists in immunization are provided at the end of the Preface.

The expert panelists met for two days during mid-1981 in order to isolate the chief outcomes which health education programs in the field of immunization could be expected to promote. After intensive deliberations, preliminary statements reflecting such outcomes were isolated, then set in priority order by the subject matter and health education experts. The evaluation and testing specialists did not participate in this setting of priorities.

The preliminary outcome statements selected by the panel were subsequently refined by the contractor's staff, then mailed to panelists as well as other interested individuals and organizations, all of whom rated the importance of each possible outcome statement. The prioritized list of outcomes that resulted was used to guide the selection and development of measures for this handbook. All newly-developed measures, along with the formal test specifications which were used to prepare them, were reviewed via mail by each panelist. In addition, many of the new measures were piloted on samples of approximately nine individuals. Feedback from these tryouts and the panelists' review was used to revise the new instruments. All of the new measures were also systematically reviewed by members of the contractor's staff in an effort to eliminate any potential sex, race, religious, or socio-economic bias.

While the new measures were being developed, a comprehensive search was conducted to locate existing measures which might match the panel-identified outcomes. The content of all these measures was carefully reviewed to ascertain its match with one or more of the panel-identified outcomes. All existing measures which corresponded to an outcome statement were then reviewed to ensure that they possessed no major technical or psychometric flaws which rendered them unsuitable for program evaluation use. Wherever there was substantial duplication among two or more existing measures, the measure which possessed the strongest supporting psychometric data, or the measure that was clearest and easiest to use, was chosen. All the existing measures which passed both the content screening and the subsequent reviews are included in this handbook.

The Handbook's Contents

There are several sections in the handbook, beginning with this Preface, which is largely an introductory elaboration of the handbook's origin and contents. The handbook's major sections are described below.

Chapter One contains a review of the fundamentals of systematic evaluation as applied to the appraisal of health education programs. Because the handbook will be used by experienced evaluators as well as by health educators with less evaluation background, it is possible that Chapter One's account of program evaluation will be of more interest to some handbook users than to others. Individuals using this handbook can decide whether their conversance with the basics of program evaluation permits them to skim Chapter One or skip it entirely.

Chapter Two describes the nature of the measures included in the handbook. The four different categories of measures found in the handbook are explained, and the interrelationships among these measurement categories are described. The rationale behind the types of measures newly developed for the project is presented. The procedures employed by project staff in locating and screening existing measures are also described.

Chapter Three provides guidelines for using the measures in program evaluation. Included in this chapter are practical suggestions regarding such matters as the selection, administration, and scoring of the handbook's measures.

Chapter Four lists the outcomes identified by the expert panel. The outcomes are presented in their amplified form, and each one is annotated to indicate where in the handbook the newly-developed and/or previously existing measures for that outcome can be found.

In Chapter Five the new measures constructed specifically for this project are presented. All of these new assessment devices are criterion-referenced measures. To facilitate use of the measures, each is preceded by a descriptor page which supplies the title of the measure, the title of the outcome for which the measure was created, and the characteristics of the population with whom the measure is to be used. This descriptor page also presents a brief general description of the measure. It must be stressed that these new measures have not yet been subjected to empirical verification, hence should be regarded as assessment devices whose technical qualities have not yet been verified.

Chapter Six contains the existing measures which were identified as corresponding with panel-approved outcomes. Each measure is preceded by a descriptor page which includes the measure's title, its authors, the type of outcome assessed, and the title of the outcome statement to which the measure corresponds. In addition, a brief description of the measure is provided, along with a summary of relevant information regarding the measure.

To facilitate photocopying and reproduction of the measures in Chapters Five and Six, all descriptive and scoring information has been placed on separate pages. The measures themselves can be readily copied and reproduced by health educators. Handbook users have permission to use all the measures in this collection for health education program evaluation, without needing to seek further permission from any authors or agencies.

In Chapter Seven the test specifications for Chapter Five's new measures are presented. These specifications consist of the rules and content constraints used to generate all new measures for the project. Each set of specifications constitutes the most complete description of the measure for which it served as the blueprint. A complete understanding of Chapter Five's measures is possible only by reviewing Chapter Seven's specifications.

An annotated evaluation bibliography is presented after Chapter Seven, to provide follow-up reading for handbook users who wish to deal at greater length with the topics developed in Chapters One through Three. The annotated descriptions should make it possible for readers to determine whether the cited reference is appropriate for their purposes.

The handbook is concluded with an Index of Measures. This index lists, by title, all of the program evaluation measures contained in this book.

Acknowledgment of Contributors

The following individuals served as expert panelists for this handbook:

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The project which resulted in the creation of this handbook was funded by the Centers for Disease Control in Atlanta, Georgia. The project was initiated by the Research and Evaluation Staff, Health Education Division, of the Center for Health Promotion and Education. Dr. Walter J. Gunn, chief of that group, conceptualized the project, set forth its specifications, and supplied technical guidance throughout the project's existence. The project was originally conceived during conversations between Dr. Gunn and Dr. Carol D'Onofrio of the University of California, Berkeley

School of Public Health. Throughout the project, those serving as project officers were Dr. Gunn and Dr. Diane Orenstein of the Centers for Disease Control and Dr. Donald Iverson and Dr. Patricia Mullen of the Office of Health Information and Promotion, Office of the Assistant Secretary for Health, Department of Health and Human Services. The project has substantially benefited from the continuing technical counsel of its project officers.

The handbook itself was developed by the following members of the staff of IOX Assessment Associates: Frank Beaudet, Phyllis Jacobson, Rebecca Jaramillo, Elaine Lindheim, W. James Popham, Celia Rodrigo, Laurie Salah, Julie Shaperman, and Elanna Yalow. Robin Harte and Cecilia Marcelino prepared all of the handbook text. Numerous health educators also offered counsel regarding the handbook's measures and introductory materials. Without their expert assistance, development of this volume would have been impossible.

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CHAPTER ONE

PROGRAM EVALUATION CONSIDERATIONS FOR HEALTH EDUCATORS[1]

The development of strategies which might prove successful for program evaluation has received substantial attention in recent years. Many of the recommended approaches to program evaluation have been formally designated as evaluation "models," that is, systematic conceptualizations of the step-by-step manner in which evaluations should proceed. Some approaches emphasize the effects of a program. Others focus on the quality of a program's procedures. Still others primarily attend to the costs associated with a program. Because evaluators now have numerous evaluation approaches from which to choose, today's health educators can select those aspects from the various evaluation models which will prove most serviceable for a given evaluation assignment.

The purpose of this chapter, therefore, will not be to present a particular evaluation model, but rather to focus on considerations central to all evaluations. We evaluate programs in order to find out if they are working and how to make them work better. Sometimes a program evaluation is conducted by an individual not affiliated with the program itself--an individual formally designated as a program _evaluator_. Far more frequently, a program evaluation is carried out by the program personnel who are actually operating the program. In such instances these health educators simply change roles for a while, exchanging their program implementation responsibilities for program evaluation responsibilities. Thus, whenever the term "evaluator" is used in these introductory chapters, it refers both to the evaluator specialist and to the program staff member serving as evaluator.

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[1] In this introductory chapter an attempt will be made to present a series of salient considerations related to the evaluation of health education programs. But, clearly, it is impossible in a single chapter to discuss all evaluation topics with adequate depth. Hence, a set of references for further reading has been provided. This evaluation bibliography, which has been annotated to provide a general description of each volume's contents, can be found on pages 189-196. Throughout the handbook's early chapters, the reader will be directed to various of these references for further information about the topics being discussed.

Focusing the Evaluation

Effective evaluations help people make better decisions about programs. Anyone setting out to evaluate a health education program, therefore, should be certain to focus the evaluation on the sorts of decisions that are likely to be at issue. This includes getting a clear idea about the purpose(s) of the evaluation as well as identifying the individual(s) or group(s) who will use the evaluation's results.

The nature of the program being evaluated makes a substantial difference in an evaluation's focus. Some health education programs are carried out chiefly to develop and refine the program itself. We can refer to these programs as experimental programs in the sense that they are programs of yet unproven effectiveness. In evaluation studies of experimental programs there is an attempt to isolate the most effective program or the most effective program components. Another type of health education program is a demonstration program, that is, a program in which proven approaches are offered in an effort to secure support or adoption from a larger clientele. Demonstration programs, then, are targeted toward two audiences, the program's participants and the individuals or groups whom the demonstration is supposed to convince. When evaluating demonstration programs, we often attempt to verify whether a program has been disseminated with fidelity to its original conception or, if not, why. Finally, there are service programs in which proven approaches are offered in an attempt to improve the health and well-being of designated target groups. In such programs evaluation often takes the form of monitoring. Two or more of these three types of health education programs can, of course, be provided in combination.[2]

Differences exist in the evaluation activities depending on the purpose of the evaluation, the type of health education program being evaluated, and the nature of the decisionmakers for whom the evaluation is being conducted. Too many times program personnel avoid evaluation on the grounds that theirs is only a demonstration program and, hence, needs no systematic appraisal. Or, again, those carrying out a service program might fail to evaluate their efforts because, "after all, we are merely disseminating a proven methodology." But program evaluation is needed for all three kinds of health education programs. The issue is not whether, but how.

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[2] For an extended consideration of these three types of programs, see Gunn, W. J. Evaluation: Proving and improving your programs. A paper presented at the Fifth International Conference on Health Education, London, September, 1979.

Objectives and evaluation. Health education programs come into existence in order to bring about worthwhile effects. Most health education programs, therefore, are organized more or less systematically around some form of program objectives. The more explicitly these objectives are formulated, the more useful they are in carrying out evaluations. Indeed, one consideration in conducting an evaluation is the extent to which a program's objectives have been achieved. It is for this reason that evaluators often work with program personnel in an effort to have those individuals create objectives which describe the desired post-program behaviors (including performance on measuring devices) of program participants.

Too often program designers describe their objectives in such lofty and loose language that it is next to impossible for evaluators, even after the program is over, to tell whether the objectives have been attained.

There is substantially more to program evaluation than merely discerning whether a program's goals have been achieved. For example, there may be program effects, both positive and negative, which although profound were not anticipated in the program's stated objectives. In addition, there is the quality of the objectives themselves. Perhaps the program's goals are truly trivial. A skillful evaluator can profitably work with program personnel to improve the nature of their aspirations. Clarified and more defensible objectives can be a boon to both program personnel and evaluators.

Summative and Formative Functions. Since the expressions "formative evaluation" and "summative evaluation" were introduced over a decade ago, considerable attention has been given to the virtues of each type of evaluation study. In the late sixties and early seventies, a good many evaluators were persuaded of the virtues of summative studies in gauging a program's overall effectiveness. To their distress, however, it often turned out that definitive judgments were difficult to achieve. Rarely did a summative evaluation study settle conclusively whether a given program was sufficiently meritorious to make a go/no-go decision on the basis of that study alone. More often than not, a host of complicating elements proved far more influential in the nature of the final decision than the results of an evaluation study.

As a consequence, it became increasingly clear that, in many instances, formative evaluation studies might prove useful. Formative evaluation is not end-of-the-line evaluation. Rather, such evaluation is an ongoing endeavor as the program is designed, installed, and maintained. Whereas summative evaluation's mission is to provide a final judgment of a program's overall merit, formative evaluation's mission is, on a continuing basis, to bolster a program's quality. The effective formative evaluator functions less as an external judge and more as a collaborator, a member of the team whose task it is to monitor the program in order to improve its quality and the decisions regarding it.

These two evaluative roles are not mutually exclusive. An evaluator's main task is to collect information which is maximally useful in improving the quality of decisions made about programs. Evaluation should identify the areas in which a health education program is having an impact, as well as those in which it is not. Effective components can then be retained; ineffective components can be strengthened or dropped. A mechanism for the systematic collection of information regarding health education programs can provide a solid data base for the continuing refinement of such programs and for improvement in the general level of services provided.

Conducting Evaluation Studies

How can evaluations be conducted so as to achieve their maximum benefits? It is sometimes thought that program evaluations must include complicated and elaborate data-gathering designs in order to yield a decisive and compelling set of data. This is simply not the case. Program personnel and evaluators should strive to conduct their studies and gather data in such a way that the ambiguity of results can be kept to a minimum. That is, evaluations must attempt to determine whether a program works, what makes a program work, or what prevents it from working. Evaluation data-gathering designs serve as the means to this end by delimiting the procedures that will be used to explore the workings and impact of a program.

The conditions under which we gather data will permit us to make inferences about a program's overall impact on participants or, perhaps, the differential effectiveness of the program's various components. To select optimal designs for their investigations, evaluators must have a broad knowledge of the available design alternatives and the strengths and weaknesses associated with each. Evaluators must also work closely with program staff to determine which decision options can actually be illuminated by evaluation studies. The most sensible evaluation study for a given context can then be planned.

Rights of Human Subjects.[3] Health education programs are designed to improve individuals' health and well-being. When we evaluate those programs, therefore, we characteristically focus on the impact of the programs on human beings. Some evaluators, however, become so caught up with the importance of appraising a health education program that they overlook the rights of the individuals being evaluated.

Above all, the evaluator should be guided by a respect for human dignity, hence should not engage in evaluative activities which in any way demean an individual's rights. Prominent among the principles which should guide evaluators is that of informed consent. The principle of informed consent requires that an evaluator secure, in advance of the study, agreement of all participants in an investigation. This consent is obtained after the potential participants have learned about the nature of the investigation, at least insofar as their participation is involved. This principle properly reflects the evaluator's concern for human dignity, since it rules out the possibility of making individuals serve, unknowingly, as subjects in an evaluation.

A key tenet in most ethical codes regarding human subjects insists on the confidentiality of all participant data gathered as a consequence of an investigation. Because the evaluator is not concerned with an appraisal of individual learners but rather with the worth of health education programs, the principle of participant confidentiality usually poses no problems. Evaluators must be careful, however, to devise protective safeguards, such as anonymous completion of forms and careful handling of data, that ensure the confidentiality of the data.

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[3] For additional information about the rights of human subjects and the ethics of evaluation, see Annotated References Nos. 1, 21, and 30.

Internal and external validity.[4] Characteristically, an evaluation examines a program's effects in order to determine whether individuals have changed as a result of their participation in the program. The pivotal issue here is whether any observed changes in the status of participants can be attributed to the program. Could other factors such as participant maturation, familiarity with the measures used in the evaluation (testing), or external influences such as a mass media campaign (history), account for the observed changes? An ideal data-gathering design helps rule out viable explanations, other than the program, for measured effects. Such a design deals with the issue of internal validity and addresses the question of whether observed effects can be attributed, with confidence, to the program. Threats to internal validity weaken our ability to attribute the effects that were observed to the program and not other factors.

Another important issue is the external validity of evaluation studies. Can the findings from a specific evaluation be generalized to the next group of participants or to variations of the program (e.g., to a similar health education program in a different school or to the same program held during the following year?) Could we expect the program to have an impact in other settings or at other times? What would be the effects with different participants, modes of presentation, or program personnel? External validity focuses on the need to demonstrate that the observed program effects can be expected to occur under conditions other than the specific instance of the program being evaluated. With external validity, evaluations can serve as more than tributes to successful programs or postmortems for unsuccessful ones by providing useful information as program personnel look to the future.

It is important to distinguish between internal and external validity, for different information may be required to establish each one. A procedure that increases internal validity may weaken external validity. Experimental control, which enhances internal validity, must be weighed against feasibility and generalizability. Evaluators must try to balance the problems associated with threats to internal and external validity, by selecting a data-gathering design that best addresses the information needs of the program and allocating evaluation resources accordingly. These priorities must come from the context of the program itself, since there are instances in which an evaluator should stress one type of validity rather than the other. Emphases on internal or external validity will vary as a function of the program decisions to be made.

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[4] For additional information about internal and external validity issues, see Annotated References Nos. 6, 9, and 10.

Design options.[5] The key to selecting an appropriate evaluation design is to pick the one that best deals with the needs of those involved with a program, such as the program's staff, participants, or funding agency. In some instances, health educators may be interested in the effects of the particular program that they are providing. "Will participants obtain necessary immunizations after attending this program?" In other instances, health educators may be trying to develop model programs that will subsequently be disseminated locally or even nationally. "Can we develop a program that will encourage individuals to obtain necessary immunizations, whether they are teenagers in Duluth, new mothers in Tampa, or working parents in New Haven?" An evaluator would have to design very different studies in order to answer these fundamentally different questions. As indicated earlier, health educators must design their studies so that they serve the specific purposes of that evaluation. There is no such thing as a general-purpose evaluation.

An understanding of a few basic principles can help evaluators select designs well suited to their needs and, perhaps more importantly, determine the limitations of whatever design is implemented. No evaluation study will be perfect. Every study leaves some questions unanswered. Evaluators need to be clear regarding what they have learned about a program and the degree of certainty associated with their findings, then convey this information to other interested audiences.

To illustrate some of the major considerations in selecting data-gathering designs, consider a six-month health education program aimed at modifying Behavior X. If participants' status on Behavior X were measured at the close of the program, we could represent that situation schematically as follows:

Program ——→ Measurement

If this were the design employed, what could you tell about the program's impact on participants' behaviors? Using such a design, how confident would you be that the participants' reported behavior changes were attributable to the program?

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[5] For additional information about evaluation design options, see Annotated References Nos. 6, 9, and 17.

It would be difficult to attribute definitively any change in behaviors to the health education program. The program, indeed, may have been totally ineffectual, and participants' post-program behaviors might be identical to those they possessed before the program. The measurement process might be detecting behavioral patterns that participants brought to the program, not those that were affected by the program. Because we have no measure of behaviors prior to the program, we can't distinguish between preexisting behaviors and program effects. Hence, with this data-gathering design, it may be impossible to discern the influence of the program.

But even with such a basic data-gathering design it may be possible to secure meaningful program evaluation data. Suppose, for example, that a health education program is promoting a knowledge outcome so advanced that you expect participants will not be familiar with its content. In that setting one could assume that any post-program knowledge is attributable to the program's impact, because participants would probably not know the information without the program. It might well not be worth the resources necessary to demonstrate conclusively that participants began the program unfamiliar with the outcome's content.

These examples illustrate the chief mission of data-gathering designs, namely, to rule out plausible rival hypotheses, other than the program's impact, that might account for the post-program status of participants. If there is reason to believe that participants' pre-program status may account for their post-program status, then a data-gathering design should be selected which permits the evaluator to rule out that rival hypothesis.

Now suppose that, in order to avoid the major shortcoming of the previous design, we measure participants' behavior both before and after a health education program. We could represent that design as follows:

Measurement ——▶ Program ——▶ Measurement

Let's assume that the result was a substantial shift toward more desirable behaviors between the initial and the final measurement. Could this change in behaviors be ascribed to the program? We cannot be sure. There are many other factors that may have led to the observed change in behaviors. For example, there may have been a significant event, an event totally unrelated to the program, which influenced participants' behaviors. If the program were designed for children, it may have been that the participants matured during the time frame of the program. Thus it may have been increased maturity rather than the program which caused the altered behaviors. The program itself may have contributed nothing to the shift of behaviors.

But, as was true with the earlier design, if the rival plausible hypotheses for explaining posttest results are accounted for satisfactorily by this data-gathering design, then it is sufficient for the task at hand. In fact, many formative evaluations feature such simple yet serviceable pretest-to-posttest designs involving only one group of participants.[6]

We can eliminate some of the more common rival explanatory hypotheses by using a data-gathering design in which we employ a comparison or control group. The use of a control group (untreated individuals) or comparison group (individuals receiving a different program) can be illustrated as follows:

Group 1: Measurement → Program → Measurement

Group 2: Measurement → Measurement

In this design, as we see, a control group (Group 2) is assessed before and after the program, but this group never receives the program itself. Under such circumstances we can be more confident that if the program participants' pre-to-post behaviors shift, and the control group's pre-to-post behaviors remain the same, the program caused the shift.

There are, however, some disadvantages to this design. It may be that the initial measurement was reactive. A reactive measurement is one which by itself, or in concert with the program, influences participants' behavior. Attitude inventories and self-report questionnaires about behavioral practices are often reactive. Suppose that in this case the pre-program instrument alerted participants to what was to be measured, hence influenced their performance on the second measurement. In addition, measurement is expensive, and measuring control groups can be a relative waste of valuable evaluation resources. Time and money can often be better spent studying the program being evaluated rather than studying a no-treatment control group of little interest. (The merits of comparative designs will be described later.) Health educators should not ritualistically employ control groups in their designs if the question at issue can be answered without their use.

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[6] Note that this design requires measurement before as well as after a program. This points to a commonly accepted but often overlooked principle of effective evaluation. Evaluation is most effective when it is initiated at the beginning of a program, often prior to the program's formal inception. If evaluators are not called in until the end of a program, they sometimes serve as little more than test proctors.

There are situations in which health educators may wish to appraise the effects of their programs on the basis of routinely administered measurements, such as periodically administered questionnaires or the kinds of archival data one often finds recorded in health agencies. For instance, suppose we were evaluating a "parent health awareness" program and were interested in the number of checkups from physicians sought by parents of infants. Assuming that such information is available in the county health department's records, the evaluator may wish to employ a time-series design. In a time-series design we measure at periodic intervals both before and after the program. By observing the pattern of measurements prior to and following the program we can discern if the program had any effect.

To clarify, Figure 1.1 presents three illustrative time-series data patterns of six periodic measurements (M_1 through

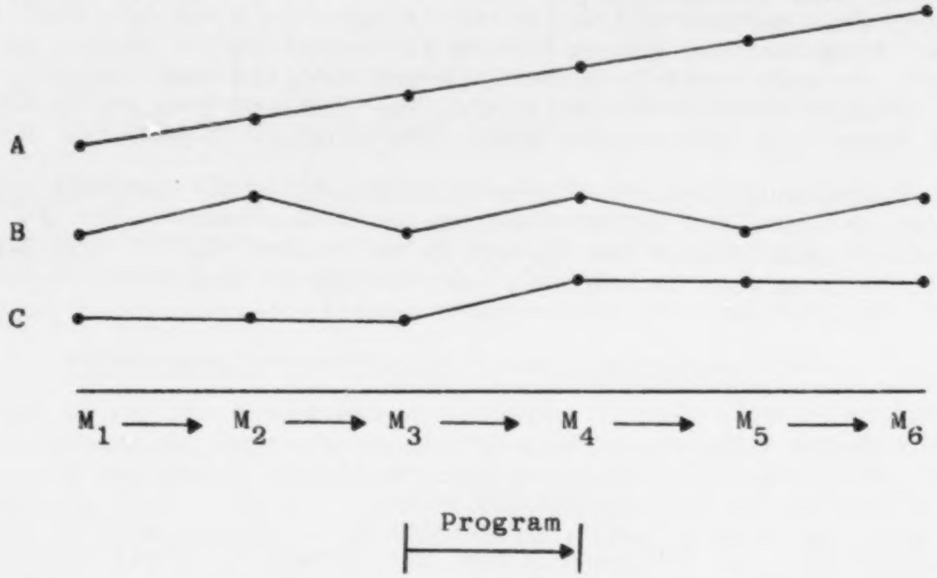

Figure 1.1. Three data patterns from a time-series design.

M_6) taken every two months over a 10-month period. A two-month health education program is offered midway in the time series, that is, immediately following Measurement Number Three (M_3) and just before Measurement Number Four (M_4). Note that the difference between M_3 and M_4 (that is, immediately before and after the program) is identical in all three data patterns. Yet in data patterns A and B we would be reluctant to attribute the M_3 to M_4 growth to the program's effects. In pattern A there are consistent increments over the entire 10-month period, not just the period associated with the program. In pattern B the increments and decrements fluctuate too much. Only in data pattern C could we make the attribution of program effects with some confidence. Although the data analysis procedures associated with time-series designs are fairly complicated, it is often possible to discern program effects merely from inspections of patterns in plotted data such as those shown in Figure 1.1.

In using time-series designs to evaluate programs, health educators must be particularly attentive to the possible contaminating impact of an event, external to the program, that may have influenced the observed data patterns. For instance, referring back to Figure 1.1, suppose that a widely publicized national outbreak of influenza had occurred at the same time that the "parent health awareness" program was being offered. Suppose also that parents were being urged by the media to seek checkups for their infants. Then the growth pattern observed in pattern C might be more associated with that event's effects than with the health education program's effects.

A time-series design, though often used with archival data, can be employed with any sort of periodically gathered data such as routinely administered attitude inventories. A time-series design can be applied to evaluate one program at a time or to evaluate several programs simultaneously. For example, suppose the three data patterns seen in Figure 1.1 were data associated with simultaneously offered programs. In this instance the program yielding data pattern C would be the only one resulting in detectable effects.

In utilizing time-series designs one must be certain to have a reasonable number of measurement opportunities over an extended time period. That is, one would not want to employ such a design unless clear data patterns were possible to discern.

Randomization[7]

In the designs we have discussed thus far, the focus has been on evaluating one program with one group of participants. This may be the situation for many health educators who are only interested in considering the specific program they are providing. But suppose, as we described earlier, you are interested in the general effectiveness of a program which will serve as a model to be implemented in a variety of settings, with different types of participants. How would you design such a study?

One technique that can prove useful in such settings is randomization. We select or assign things randomly when we do so in a nonsystematic manner, such as by using a table of random numbers (found in most statistics texts). When the participants taking part in the program to be evaluated have been selected at random from a larger population of potential participants, then we can be reasonably confident that those involved in the evaluation will be representative of that larger population. There is less likelihood that the participants being studied in the evaluation are atypical, hence inappropriate subjects to include in the study.

This sort of randomized selection of subjects is particularly important when we wish to generalize from the results of our study to a larger population. This procedure may also be useful when there are more applicants than vacancies for a program or when not all potential clients can be served.

Another use of randomization arises when we determine which of several programs individuals are to receive. If we want to compare the effects of different programs, then we want to be as equivalent as possible. To this end we can employ a randomized assignment procedure whereby we randomly place individuals in the programs to be compared.

The two procedures of randomized selection and randomized assignment are illustrated in Figure 1.2. Note that we randomly select participants for programs from the pool of potential participants, then randomly assign those individuals selected to either Program A or Program B.

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[7] For additional information about randomization, see Annotated References Nos. 6 and 19.

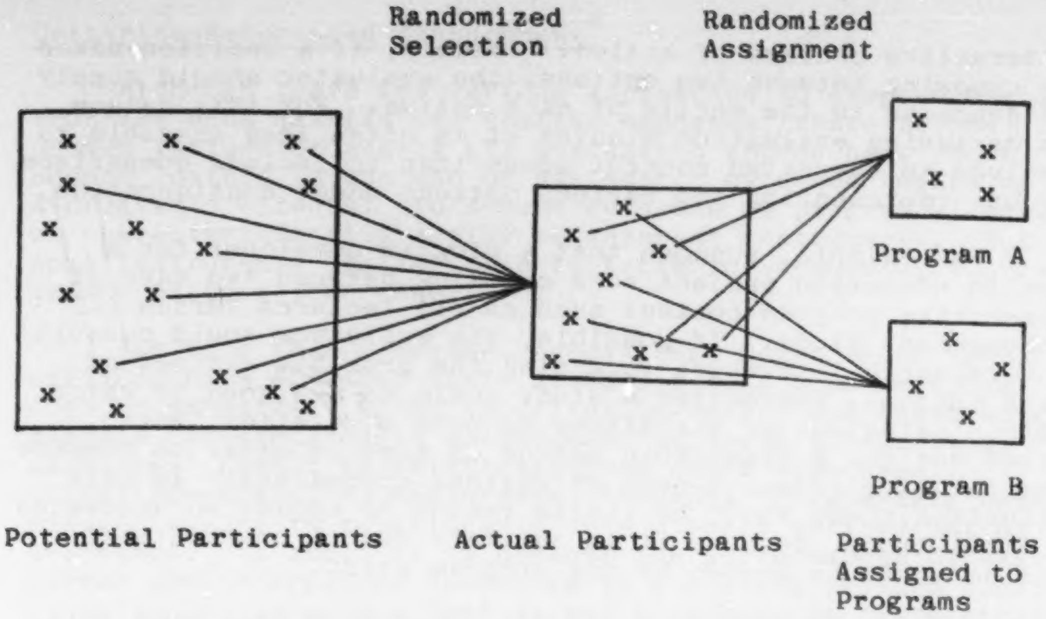

Figure 1.2. Randomized selection of participants from pool of potential participants and randomized assignment of participants to programs.

In actual practice, of course, program personnel often do not have the luxury of constituting groups via randomized selection or assignment, and there are in fact situations where program personnel would not want to use such procedures. As a consequence, we are frequently obliged to use evaluation designs that can help disentangle program effects from preexisting differences either between participants in different programs or between participants and nonparticipants in the same program. Program evaluators should become conversant with such comparative designs and the settings in which they should be used, in order to select a design that will be most effective in forestalling the likelihood that factors other than the program itself accounted for participants' post-program status. Design selection must always be tempered by practical constraints such as available financial resources and the acceptability to program sponsors and participants of randomization techniques.

Comparative designs. The use of comparative designs also can prove helpful in the effort to come up with meaningful data. Comparative designs, in fact, arise because of the basic function of evaluators, namely, to aid decision-makers. Decision-makers ordinarily make selections among alternative courses of action. Ideally, if a decision-maker is choosing between two options, the evaluator should supply evidence as to the merits of each option. For this reason, in designing evaluation studies it is often less sensible to include an untreated control group than to include comparison groups representing the various options under consideration.

For example, suppose that a program developer for a health education project were choosing between two ways of presenting program content such as (1) lectures versus (2) independent study. If possible, the evaluator would consult the research literature regarding the probable virtues of each option. Thereafter a study could be designed in which both strategies, or variations of both strategies, were tried out for a reasonable period of time in order to compare the relative effectiveness of various approaches. In this situation there would be little reason to employ an untreated control group, because it is unlikely that a no-treatment option would be chosen by the program staff.

The data-gathering designs treated here have been relatively simple. There are, however, a number of far more complex designs than we have considered. Inexperienced program evaluators sometimes become so entranced with complicated data-gathering designs that they compulsively apply them whenever carrying out an evaluation study. But evaluators do not need to employ excessively complicated designs. There are innumerable instances when simple data-gathering designs are sufficient.

This is particularly true in formative studies when evaluators are looking for rapid-turnaround data to guide program personnel in making upcoming program decisions. In such settings the evaluator needs to assemble timely decision-relevant information. The use of complex data-gathering designs may, in such circumstances, represent a squandering of evaluation resources. Only when complex designs are needed to eradicate threats to internal or external validity should they be adopted.

Program evaluators frequently also are so concerned about detecting the effects of programs that they fail to consider the costs needed for the programs to produce those effects. Yet decision-makers need guidance regarding not only the results they can expect from a program, but also the financial resources required to achieve those results. For this reason program evaluators should consider the relative costs of programs. To illustrate, how much does it cost Program A to produce a given result in relationship to how much it costs Program B to produce comparable results? Judgments about a program's impact in the absence of considerations about its costs are potentially superficial.

Criterion-Referenced Measurement[8]

Although there are various approaches to program evaluation and each has its own special emphases, there is one common feature of nearly all evaluation approaches. That common feature is the use of systematic evidence regarding a program's effects. To secure evidence of program effects, we characteristically employ measurement instruments. But some instruments are far more suitable for assessing a program's effects than others.

For more than a decade, educational measurement specialists have directed their attention toward an emerging form of assessment known as criterion-referenced measurement. Whereas norm-referenced measurement attempts to ascertain examinees' status in relationship to other examinees, criterion-referenced measurement attempts to ascertain examinees' status in relationship to a clearly defined set of behaviors. In fact, it is because the performances of examinees are interpreted according to a clearly defined domain of criterion behaviors that we say a measure is "referenced" to those criterion behaviors, hence classified as a criterion-referenced measure.

The essence of a criterion-referenced instrument is the clarity with which it describes that which is being measured. Because norm-referenced instruments are relative measures, emphasizing relative comparisons among examinees, they often do not provide a clear description of exactly what it is they are assessing. In contrast, because criterion-referenced instruments are absolute measures, designed to determine exactly what it is that examinees can or cannot do, independent of the performance of other examinees, they should provide an unequivocal description of what they are measuring.

It is this clarity regarding the attributes that they assess that renders criterion-referenced measures ideal for program evaluation. Consistent with the spirit of providing useful information for decision-makers, criterion-referenced instruments describe, with precision, the nature of what is being measured. Hence, when criterion-referenced measures are used in a program evaluation, decision-makers can readily interpret the evidence being supplied.

The best way to describe what a particular criterion-referenced instrument measures is via the test specifications which are developed to generate the items on that measure.

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[8] For additional information about the nature and development of criterion-referenced measures, see References Nos. 4, 18, and 27.

Test specifications identify the particular rules and content limits used in constructing a measure. The test specifications operationalize the attributes which are being assessed by delimiting the eligible content and format of the measure.

As with any assessment strategy, there are varying degrees of quality in criterion-referenced measures. Not every instrument described as "criterion-referenced" truly deserves that label. Evaluators of health education programs, therefore, should become knowledgeable regarding the characteristics of high quality criterion-referenced measures. Several dimensions of a properly constructed criterion-referenced instrument are described below.

Clarified descriptions. The single most important element of a properly constructed criterion-referenced instrument is that it adequately describes the attributes it claims to measure. That description, contained in the test specifications, may take a variety of forms. Irrespective of the particular scheme employed, when one reads the descriptive information associated with a criterion-referenced instrument, it must be possible to discern unambiguously what is being measured. By inspecting the test specifications in Chapter Seven the reader can get an idea of the level of descriptive rigor required by criterion-referenced tests.

A manageable number of attributes. Historically, many measures have attempted to cover vast arrays of content. The net effect of this broad coverage has often been that those attempting to use the results from such instruments become overwhelmed by the profusion of discrete attributes being assessed. A properly constructed criterion-referenced instrument will focus on a limited number of dimensions. As a consequence, program personnel can direct their efforts toward those dimensions and evaluators can describe program effects along those dimensions. A criterion-referenced instrument that attempts to measure 10 or 20 discrete outcomes, for example, would likely prove less useful to program personnel and evaluators than an instrument which measures only one significant attribute. In some instances, particularly for diagnostic purposes, it may be helpful to design an instrument that assesses the major subdimensions of a more general attribute. Even in such cases, however, the guiding rule should be to employ only a manageable number of categories.

An adequate number of items per measured attribute. In order for a measure to yield adequate information about examinees' status regarding a given attribute, it is useful to provide multiple instances for examinees to display that attribute. Hence, criterion-referenced measures should provide a reasonable number of test items for the attributes that they measure. It is probably insufficient to attempt to measure a cognitive or affective attribute with one or two test items only. In some cases, a handful of test items per measured attribute or its subdimensions can aid the evaluator in gaining rough estimates of certain program effects. But, generally speaking, at least five to ten items per attribute typically constitute a minimum for measuring significant knowledge, skill, and affective outcomes in the health field.

Reliability.[9] Criterion-referenced instruments, just as norm-referenced instruments, must measure whatever they are measuring with consistency. The consistency with which an instrument measures is known as its reliability. To illustrate, suppose a 30-question knowledge test is administered on a given day, then re-administered to the same examinees five days later, with no intervening instruction. If the test is reliable, we would expect examinees to receive essentially the same scores on both testing occasions. If the test, when re-administered, yields substantially different examinee scores, we know that the test is not measuring with consistency, forcing us to conclude that it is unreliable.

There are several different kinds of reliability indices which can be calculated to reflect the consistency with which a given instrument measures, for example, test-retest or equivalent forms reliability. The kind of reliability data needed to appraise a measure for possible use in an evaluation study should be in accord with the way the measure will be used in the study. If a measure is to be used on a test-retest basis in an evaluation, for example, then information about that type of reliability is germane.

All reliability coefficients range from 0 to 1.0, with coefficients of .80 or higher indicating highly reliable measures. Although space limitations preclude a more complete discussion of reliability, evaluators need to become conversant with this key attribute of properly constructed tests. At this point, it must suffice to alert program evaluators to the importance of securing evidence regarding the reliability of any measure to be used in an evaluation study.

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[9] For additional information about determining the reliability of measuring instruments, see Annotated References Nos. 2, 15, and 27.

Validity.[10] An imperative attribute of a properly constructed measure is that it be valid. An instrument is valid if it measures what it purports to measure. To illustrate, in the health field we often use self-report measures as a way of finding out about individuals' "real life" behaviors. If our self-report inventories are valid, then those measures will secure responses which are accurate indicators of the way that respondents actually behave. To the extent that responses on the self-report measures do not coincide with respondents' actual behaviors, then the measures are invalid.

There are several varieties of validity studies, each yielding somewhat different but conceptually related sorts of evidence about a measure. For example, one approach to validity arises when we use self-report measures as proxies for physiologic measures, such as when we use self-report questionnaires to elicit an account of participants' health behaviors, then attempt to correlate the questionnaire responses with the results of physiologic tests that reveal something about people's actual behavior. If the questionnaire data do, in fact, correlate substantially with the physiologic measures, then the questionnaire is, at least to some extent, validated.

Another approach to validity arises when we use measures as predictors of some subsequent criterion behavior, such as when we try to use responses to an affective inventory gauging one's intention to engage in a particular health behavior as a predictor of individuals' later health behaviors. If the affective measure does, in fact, correlate substantially with subsequent observations of the health behavior, then evidence of the measure's validity has been obtained.

Absence of bias.[11] In the past decade or two we have become sensitized to the distressing truth that many educational assessment devices contain items which are biased against particular subgroups such as ethnic minorities and women. An example of a biased test item would be a knowledge question which, because of peculiarities in its content or its wording, is more difficult for lower-income examinees to understand and answer correctly. Test items which use content and terminology apt to be known only by the affluent would certainly be biased against the less economically advantaged.

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[10] For additional information about determining the validity of measuring instruments, see Annotated References Nos. 2, 15, and 27.

[11] For additional information about methods for avoiding test bias, see Annotated References Nos. 5 and 25.

Other sorts of bias which can adversely influence examinees' performances arise when test items are offensive to particular groups of individuals. For example, if test items include content that is seen to be derisive to women or to members of particular ethnic groups, then examinees from those groups are not apt to perform at their best on such items because agitation over the offensive content may interfere with their responses to the items.

A properly developed measure will pay adequate heed to the avoidance of biased items. There are now available both judgmental and empirical techniques for detecting the presence of biased items in measures. One or both approaches should be used to determine the degree of bias in criterion-referenced test items.

In reviewing the various dimensions of a properly constructed criterion-referenced measure, it is important to note that any given instrument may not possess all these qualities. Often one must choose among measures which embody some but not all of these elements. The important point is that merely because a measure is labeled as criterion-referenced does not indicate that it is of sufficient quality to be used with satisfaction in evaluating a health education program. Further scrutiny of the measure's quality is mandatory.

Sampling Considerations for Data Collection[12]

The data-gathering requirements of evaluation can, if evaluators are not attentive, become a disruptive and burdensome intrusion into ongoing programs. Accordingly, skillful evaluators should restrict their data-gathering forays to the least intrusive form possible.

One way to minimize an evaluation's intrusiveness is through sampling. Although most people are familiar with the form of sampling that involves selecting some individuals from larger populations of individuals, it is also possible to sample items when administering program evaluation measures.[13]

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[12] For additional information about sampling procedures, see Annotated References Nos. 7 and 8.

[13] A measure, such as the criterion-referenced measures found in Chapter Five, generally consists of a group of items, such as questions on a test or statements on an attitude inventory.

To estimate how a large group of people would respond on a particular measure, it is not necessary to administer that instrument to all the individuals in the group. Instead, we can sample individuals from the group by selecting either a simple random sample or a random sample stratified on the basis of program-relevant factors such as age, sex, and socioeconomic status. Assuming that the sample is correctly drawn, we can estimate the status of the total group based on the responses of this sample.

In the version of sampling described above, we select representative samples of people to represent a larger population. Suppose, for example, that an evaluator has a measure that is to be used to determine program effects. Assuming a reasonably large number of program participants, say 50 or so, we could randomly administer the measure to one half the participants only. In essence, this approach allows us to infer how the total group of participants would score on the measure although only half of the participants completed it. We could thus estimate how the total group of participants would have responded, yet halve the amount of participant time required for data-gathering.

In a similar sampling procedure, we could administer two or more measures at once. Suppose that two measures, Inventory X and Inventory Y, are to be given to program participants. We can randomly assign one half of the participants to one measure and one half to the other. While each participant needs to respond to one measure only, we can still derive a defensible estimate of how all the participants would have responded to both instruments.

In addition to sampling persons, as in the previous examples, it is also possible to sample items so that different sets of items are randomly selected to be administered to different persons. In such an approach we give each program participant only a sample of the items for which we want to obtain evaluation data. For example, suppose a program evaluator wishes to administer a 40-item test. Given, say, 60 participants in the program, the evaluator could divide the test into four sets of 10 items each and administer each set of items to 15 participants. By having the four groups of 15 participants each complete a different set of 10 items, the total group's performance can be estimated. This approach allows the data-gathering to be carried out in one-fourth the time that it would have taken to administer the total 40-item test to all participants.

Given the relatively small numbers of participants in some health education programs, is it really appropriate to sample either persons or items? How large must groups be before sampling procedures can be sensibly used? Although an unequivocal answer to this question would be desirable, such a definitive answer does not exist. Some texts on sampling do provide rules of thumb for estimating the size of samples needed for detecting group differences in relationship to the magnitude of differences sought and the nature of the groups being sampled. At best though, these are rough estimates. It is important to recognize that the task of identifying a sufficiently large sample is more difficult than usually thought.

Intuitively we may recognize that when we start with a very small group of program participants, the use of sampling is risky. For instance, if there were only 15 participants in a program, few health educators would try to split these participants into three groups of five each for purposes of taking different tests. Even though each group represents one-third of the total population, there is too much likelihood that a sample of five individuals does not properly represent the total group.

The variability of participants' anticipated performances on the measures is the primary influence on the sample size necessary. The following example illustrate this principle. If a man's socks were all stored in a drawer, yet there were only black and brown pairs, he wouldn't need to draw out too many pairs until he had a reasonably good idea of the characteristics of the total population of socks in his drawer. But suppose he had socks in 10 different colors. Then he would most likely have to take out many more pairs until he could reach an accurate estimate of the colors of socks in the drawer. In much the same way, if it is expected that participants' scores on a test will be relatively homogenous, then a smaller number of respondents will be needed than if participants' scores are expected to be widely varied.

In considering any of these sampling procedures, it should be noted that the evaluator is essentially focusing on a group of participants _in the aggregate_. Because evaluations are typically concerned with the effects of programs on groups of participants, sampling procedures are usually appropriate. If, however, program personnel need individual data on all examinees on all measures, then sampling is not appropriate.

When to Administer Measures

Decisions regarding when to administer the measures depend on the data-gathering design selected. Conceivably, there are five time periods during which it may be useful to obtain information on participants, and there may be reasons for repeated measurement during some of these periods. These time periods are depicted in Figure 1.3.

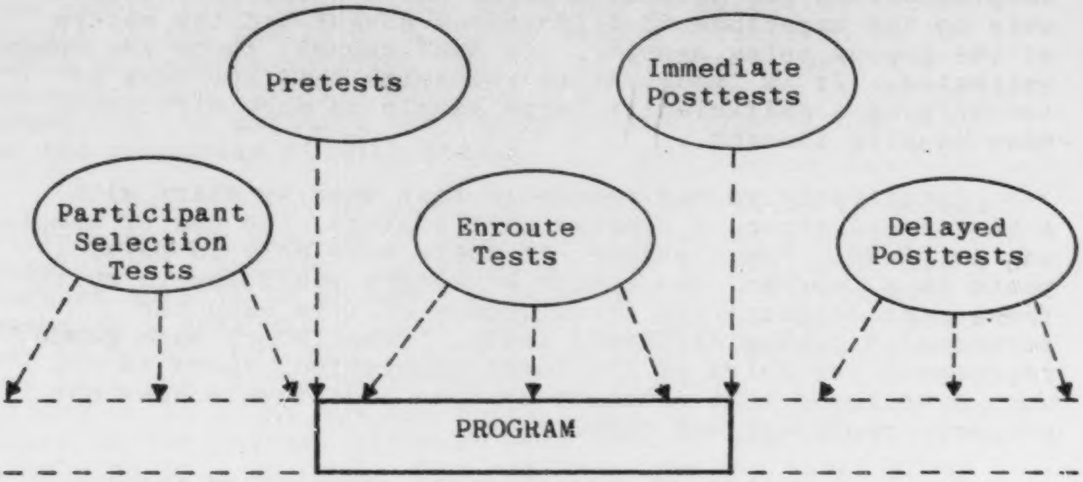

Figure 1.3 Possible measurement times in program evaluation studies.

The first point at which one might choose to obtain information would be prior to the selection of participants. In some health education programs anyone who wants to attend the program is admitted. In other programs there may be more applicants than program openings. Or perhaps there are multiple variations of a program, and different participants must be assigned to different variations. In these latter cases it may be useful to have information to help in the selection of participants. One may want to select as participants those individuals most in need of the program, or those with the most (or the least) perceived ability to attain the behavioral change sought in the program. In any event, information at this juncture may help the selection process become more effective than it might otherwise be.

Often it is useful to have information about participants immediately prior to their starting the program. Such data, often referred to as pretest data, may be used to identify participant weaknesses so that instruction can be targeted directly to those areas rather than emphasizing things that participants already know. Such data may also be used as a baseline, in conjunction with data collected at the end of a program, to determine the impact of the program. If data have already been collected on participants at the selection stage, it might be unnecessary to re-administer measures unless it has been a long time since the initial administration, or unless there are reasons to expect a change in participants' performance.

Measures can also be administered during a program to secure a current reading on the status of participants. Such en route data can be used to redirect program resources during the program itself. One or more en route measurements can provide program personnel with ongoing status checks on participants' progress. Such data may be even more useful than data collected at the end of a program, for they provide information while there is still time to act on it.

Immediate posttest data are data collected directly following the program. Such data may be compared to pretest data in order to provide an estimate of the changes in participants following participation in the program. Participants' posttest performances can also be contrasted with scores from participants in other programs. Such data may also be used by themselves as a measure of the absolute status of participants.

Delayed posttest or follow-up data, e.g., data collected one year after a program's conclusion, are often equally if not more important than immediate posttest data in evaluating a program. Far too frequently data collection efforts are limited to immediate outcomes, when measurement is most convenient. Ultimately, however, program personnel are more interested in effecting long-term behavioral, affective, or cognitive changes. It is sometimes difficult to infer such long-term changes on the basis of information gathered solely at the end of a program. Hence, some follow-up measurement, perhaps repeated, is usually warranted.

Clearly, it is not sensible to administer all measures at all time periods. Evaluators, in collaboration with program personnel and other interested parties, need to select an evaluation design that focuses on the most appropriate times for gathering data. Just as one wishes to avoid administering an overwhelming number of different measures, one also needs to avoid an overwhelming number of administrations. In some situations it may be useful to administer certain measures on a continuing basis (e.g., a behavioral measure), while others might be administered far less frequently. Decisions about when to administer what sorts of measures should be guided by common sense, attentiveness to participants' rights and feelings, and the efficient use of resources.

Data Analysis[14]

A frequent question in evaluation is whether the results of the evaluation are statistically significant. Could observed effects of the program have occurred merely because of the particular sample used in the study? Are the differences so small that they might have occurred simply by chance? Statistical tests are used to answer these questions, and in order to do so these tests make certain assumptions about the data being analyzed.

To illustrate the sorts of assumptions that statisticians make about the data they analyze, we can consider levels of measurement scales. Statisticians draw distinctions between various levels of measurement, that is, data gathered from nominal, ordinal, interval, and ratio scales. Nominal scales classify information into categories without any implied order. For instance, when we categorize individuals into groups of immunized and unimmunized individuals, this is a nominal scale. Ordinal scales rank data in order, such as when we might rank a number of individuals according to their overall healthiness. An interval scale is one which assumes that there are equal intervals between equidistant points on a scale. To illustrate, a 10-point difference between scores of 43 and 53 on a 100-item test about the effectiveness of immunization would be considered identical to a 10-point difference between scores of 67 and 77. A ratio scale is an interval scale for which a zero point exists, such as a weight or height scale, in which there is a true zero.

When we select statistical techniques, it is important to match the statistical test with the type of data being analyzed. For example, in analyzing nominal data one must use statistical techniques specifically designed for such situations. Chi square, for instance, is one of several frequently employed nonparametric techniques for analyzing nominal data. Other nonparametric techniques are used to analyze ordinal data. A chi square test can be used to compare the actual frequencies in two or more nominal categories (such as immunized versus unimmunized children) with the frequencies which might be expected by mere chance. Chi square, however, would not be a wise choice for analysis of ordinal or interval data because nonparametric tests fail to use all of the available information, hence are typically less powerful than more appropriate alternatives. Thus, one must be certain that the assumptions associated with particular statistical techniques have been satisfied.

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[14] For additional information about data analysis, see Annotated References Nos. 13, 19, 28, 33 and 35.

The following statistical procedures are ones that are used primarily with interval and ratio data, that is, data which assume equal intervals between points on the scale. Such procedures are known as parametric tests. Cognitive tests are almost always assumed to be interval scales. In addition, attitude scales, although not necessary interval scales, are often analyzed using parametric procedures under the assumptions that the points on the scale reflect equal increments of the characteristic, and that the analyses are only slightly distorted if this assumption is violated. Thus, knowledge, skill, and affective measures are frequently analyzed using the following procedures.

One of the most basic parametric procedures used is a *t* test, which is used to test the significance of the difference between two independent means. (Recall that a mean is the arithmetic average of a group of scores, computed by summing all the scores in a group, then dividing this total by the number of scores in the group.) Suppose, for example, that an evaluation were conducted to compare the effectiveness of two health education programs, and that at the conclusion of each program a knowledge measure were administered to a sample of participants. A *t* test could be used to compare the mean posttest scores of those two programs to determine if observed differences were statistically significant. If there were three or more programs being compared in this way, an analysis of variance (ANOVA) would be used.

Two other techniques, gain scores and analysis of covariance (ANCOVA), are frequently used (and, unfortunately, frequently misused) when both pre-program and posttest data are available for participants in one or more programs. Both techniques use pre-program information in an attempt to compensate for initial group differences between participants in different programs. So, for example, if an evaluator were interested in determining the degree of attitudinal or cognitive change in participants as a result of a program, the evaluator might compute a gain score (posttest score minus pretest score) as a measure of change. However, dangers associated with the use of gain scores are well documented, and such scores should not be used without considering the ways in which they may be misleading.

ANCOVA is frequently used when an evaluator wishes to compare the mean differences between two or more programs on a posttest measure (as in ANOVA), but recognizes that there may have been preexisting differences among the groups, as identified by a difference on mean pretest scores or demographic differences among groups. ANCOVA compares posttest means after an adjustment to the posttest scores has been made for these preexisting differences. Unfortunately, however, if these differences are systematic and not a function of random differences among groups, ANCOVA does not provide an adequate method for equating the groups. Hence, evaluators and program personnel need to use caution when conducting such an analysis or interpreting results from it.[15]

As one becomes more conversant with the purposes sought by various statistical analysis procedures, it is possible to consider those purposes in relationship to the levels of measurement (e.g., ordinal) required of each procedure so that a routine guide to the selection of statistical procedures is available. For example, the three general purposes of statistical analysis are description, association (correlation), and comparison (difference-testing). We can cross those purposes with the three most common types of data and secure a 3 x 3 table in which, for example, to test the differences between two sets of ordinal data we would use a nonparametric Mann-Whitney test. Such tables are found in numerous statistics texts, including several of those cited in the handbook's annotated references.

Another choice-point faced in the analysis of data concerns the appropriate *unit of analysis*. Most people are familiar with analysis procedures in which the individual participant is the unit of analysis. Yet, there are instances in which the unit of analysis treated statistically should not be the individual participant but, rather, a group of participants. The guiding principle in selecting an appropriate unit of analysis is that one should choose the smallest *independent* unit to analyze. To illustrate, suppose a health education program involved the use of peer support discussion groups of 10-12 people each in order to encourage adoption of a given health-related behavior. Because the individuals in each group would surely interact during discussions, hence not be independent, one should consider *each group's average score* to be the unit to be analyzed. Again, the focus must always be on the smallest independent unit capable of being analyzed.

Statistical tests only help us detect *statistical significance*; they do not help us determine whether an observed difference has *practical significance*. A small difference between the average scores of two groups can be statistically significant, particularly when large numbers of participants are involved, yet be of no practical consequence whatever. Health educators will need to make sensible determinations regarding whether the magnitude of an observed difference, even though statistically significant, is sufficiently important to warrant action. In other words, though evaluators of health education programs should often carry out statistical significance tests, they should not be unduly swayed by the results of such analyses. Common sense must always be applied regarding the meaning of a statistically significant result.

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[15] There are numerous statistical computer packages and programmable calculators that conduct these and many other statistical procedures for users. To optimize the ease and efficiency of data analysis efforts, evaluators should anticipate likely procedures for analyzing their data and collect data in the manner most compatible with their analysis plan and the available computer software.

Reporting Results[16]

Reporting the results of an evaluation study is a more difficult undertaking than is usually recognized. Results must be reported to decision-makers in a timely fashion. It does no good to receive an evaluation report three weeks after key program decisions needed to be made. Evaluators must also pay careful attention to the schemes they will use to disseminate their studies to all appropriate audiences. If possible, an evaluator should circulate preliminary drafts of a program evaluation to program personnel so that they can react to its accuracy and objectivity.

The decision-makers whom evaluators are assisting may have little experience with quantitative data. As a consequence, complicated statistical presentations may be of little value to them. Evaluators should select data-presentation procedures consonant with the technical sophistication of the decision-makers involved.

There is nothing wrong with simple graphs or "percentage correct" tables. If Program Z participants outperformed Program Q participants by 15 percent, then a bar graph representing that difference is a readily understood technique for communicating Program Z participants' advantage. (In the creation of such graphic presentations, be certain that the form of the graph accurately represents the data being depicted.) The more intuitively comprehensible the data presentation techniques, the better. Program evaluators should provide straightforward presentations of data, not fear that such approaches will be regarded as too elementary. Adequate technical back-up can be appended elsewhere.

Evaluators should not be afraid of making speculations based upon their hunches about a program so long as such conjectures are identified as such. Similarly, if any of the evaluation's findings are equivocal, then the evaluator should advise concerned audiences of this. Honesty and objectivity are the hallmarks of effective evaluation reporting. In addition, since decision-makers are typically busy people, evaluators should strive for reasonable brevity in their reports. The use of executive summaries to accompany lengthy reports is a useful practice.

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[16] For additional information about reporting the results of an evaluation, see Annotated References Nos. 21 and 26.

The fundamental concern regarding reporting of results is that the whole thrust of the evaluation enterprise is to sharpen the decisions that are made. Decision-making will not be illuminated by incomprehensible presentations. The quality of decision-making can be enhanced only if data are understood.

Linking Measurement and Program Design

As has been stressed earlier, criterion-referenced measures are primarily useful in that they provide a clear description of what is being assessed. Those descriptions can be particularly useful to program designers and program evaluators as they attempt to create programs which focus on promoting certain attributes. To illustrate, one powerful instructional principle for promoting skills involves providing students with adequate "time-on-task." By giving students sufficient time-on-task, that is, sufficient opportunity to practice the skills sought, students can more readily attain those skills. The clarity with which a criterion-referenced measuring instrument explicates the skills that it is measuring makes it possible for program designers to organize instruction that will be congruent with the measures being employed and, thus, enhance the likelihood that program participants will acquire those skills. A health education program's designers should become intimately familiar with an intended posttest's specifications before they put together their program. Clearly described measures can become powerful catalysts to effective program design.

Ideally, the measures used to evaluate a program will have been deliberately constructed so that they not only assess important outcomes, but also so that they assess them in such a way that those outcomes can be promoted more effectively. Part of the challenge in evaluating health education programs is to select criterion-referenced measures which are not merely end-of-program gauges of effects. Instead, measures should be selected which function proactively to guide program designers and program evaluators as they attempt to improve the program's quality.

CHAPTER TWO

A DESCRIPTION OF THE HANDBOOK'S MEASURES

Chapters Five and Six of this handbook contain a number of program evaluation measures. These are measuring instruments which may be employed in the evaluation of immunization health education programs. Measures are provided for four different target populations. These populations are parents and guardians, adults and adolescents, elementary school children, and immunization providers. In this chapter the general nature of these measures is described and several types of measurement strategies not included in the handbook and also discussed.

Varieties of Assessment Instruments

There are numerous ways of classifying measuring devices. Sometimes, for example, tests are distinguished according to the way in which an examinee's responses are scored. To illustrate, we often refer to objectively scored tests such as those consisting of multiple-choice items. We also refer to subjectively scored tests such as essay examinations.

More frequently, however, measuring devices are categorized according to the type of examinee behavior that the measure is designed to elicit. One of the most commonly employed schemes for classifying measures is the three-category division of cognitive, affective, and psychomotor behaviors. A cognitive measure focuses on an examinee's intellectual behaviors. An affective measure deals with one's attitudes, interests, and predispositions. A psychomotor measure gauges one's proficiency in performing small or large muscle skills.

In reviewing the types of outcomes sought by most health education programs, four readily distinguishable categories account for the major outcomes of interest to educators. These four categories have been used in developing and categorizing this handbook's measures.

Four Categories of Measures

The four categories used to classify measures in the handbook are (1) behaviors, (2) knowledge, (3) skills, and (4) affect. It is generally held that individuals' behaviors are influenced by their knowledge, skills, and affective dispositions. Consonant with that view, when the expert panelists isolated outcomes for which measures were to be included in the handbook, they first identified potential behavioral outcomes, then attempted to isolate the knowledge, skill, and affect outcomes which would contribute to each behavioral outcome. Let's look more closely now at each of the four types of measures included in this handbook.

Behavioral Outcomes. Measures for behavioral outcomes attempt to assess the routine behavior of individuals under normal circumstances, such as whether or not individuals obtain necessary vaccinations. Most health education programs strive to bring about lasting behavior changes in program participants, hence are ultimately focused on the promotion of behavioral outcomes. For example, a program designed to encourage parents to have their children immunized is less concerned with participants' end-of-program scores on a written test about the effects of contagious diseases than with their actual behavior well after the program has ended.

Knowledge outcomes. Most health education specialties have a great deal of knowledge, that is, factual information, which can be transmitted to program participants. The evaluator's task is to employ measurement devices which can effectively assess participants' abilities to recall this information. Most such tests consist of objectively-scored paper-and-pencil measures of one sort or another.

Knowledge tests typically pose a variety of questions related to the factual information being assessed. In most of these tests there is substantial ambiguity regarding what information is eligible for testing. Suppose, for example, that an instructor in an immunization program merely knew that there would be questions on a posttest dealing with polio vaccinations. There is simply no way to anticipate the enormous variety of test items which could be constructed regarding polio vaccinations. To the extent that the program's quality is being judged, at least in part, by participants' performances on the posttest, the program's evaluation is at the mercy of an item-writer. No one except the item-writer knows for sure what is to be tested.

To counteract this difficulty, all of the knowledge measures specially developed for this handbook consist of test items based directly on a series of statements embodying important factual information related to the content area being tested. All of the test-eligible statements are listed in the sets of test specification used to generate the test items. (See Chapter Seven) In addition, the test specifications set forth the permissible variations of these statements that can be used to create binary-choice True/False items. As a result, both the program's instructional staff and the evaluator possess an unambiguous idea of the universe of content upon which the knowledge tests will be based.

One advantage of using binary-choice test items is that an exhaustive list of all the content eligible for testing can be compiled. An additional advantage of the binary-choice approach to the assessment of knowledge is that if the program is targeted at individuals who do not possess reasonable reading skills (such as, say, limited English-speaking participants), the items can be read aloud to examinees with little increase in the necessary testing time. Reading aloud a series of multiple-choice or matching items would be far more cumbersome.

It is sometimes feared that the results of a binary-choice test may reflect mere chance rather than what examinees actually know, simply because examinees can correctly guess answers at a 50 percent rate. Although it may be true that guessing can play a major role with one or two True/False items, with longer tests the odds of guessing one's way toward success are slight indeed. For example, there is one chance in four that an examinee could correctly guess answers on two binary-choice items. To guess ten out of ten such items correctly, however, the odds shrink to less than one in 1,000. By using binary-choice tests that contain a sufficient number of items, for instance, tests with 20 or more items, we substantially reduce the likelihood that guessing will so influence an examinee's test score that we do not secure a reasonable estimate of that examinee's knowledge.

Because examinees will always be able to guess some items correctly on a binary-choice test, program personnel should not become too jubilant over scores that are slightly above the 50 percent correct expected by chance alone. By using reasonably long binary-choice tests, however, there usually will be more than enough variability in examinee performance to detect differences in the effectiveness of programs.

Skill outcomes. Outcomes dealing with participant skills are those which call for examinees to apply knowledge, not merely recall it. The attributes assessed in the handbook's newly-developed skill measures are all higher order cognitive skills. For example, an immunization provider's ability to store, administer, and prepare immunizations would be an example of the type of skill measured by the handbook's skill measures.

These skill measures generally emphasize test items in which the examinee is asked to employ higher order cognitive processes to distinguish among choices in a variety of simulated real-life settings. All of these choices focus on health-related courses of actions that an individual might pursue. In other words, application, not recollection, has been sought in the handbook's skill measures, forcing examinees to employ skills in settings approximating those they would encounter in real life. In many instances the skill measures build directly on the knowledge measure(s) associated with outcomes most closely related to that skill.

Affective outcomes. Affective outcomes refer to the variety of non-cognitive variables, such as attitudes, interests, and values, which are thought to predispose individuals to act in a particular manner. A negative attitude toward immunization, for example, is believed to incline a person to avoid obtaining necessary vaccinations. Similarly, a positive attitude toward the virtues of immunization is thought to dispose a person toward obtaining necessary immunizations.

Although it is possible to infer the nature of an individual's affective status from observations of that person's behavior, the most common technique for assessing affect involves the use of self-report inventories. The manner in which the items on a self-report affective inventory are constructed yields scores which require either (1) little in the way of inferences to interpret the scores or (2) substantial inferences in interpreting the meaning of the scores. We refer to the former as low-inference self-report measures, and to the latter as high-inference self-report measures.

Low-inference self-report measures typically present respondents with a series of straightforward questions or statements such as those asking for the degree of agreement with positive and negative statements about the effectiveness of immunization. Responses to such measures can be readily interpreted if respondents are telling the truth. To heighten the likelihood of securing truthful responses, those completing affective measures are often directed to return them anonymously.

High-inference self-report measures are typically designed to be less transparent in what they are attempting to measure. To illustrate, if a relationship had been found between parents' educational levels and the extent to which they have their children immunized, we might ask people about their educational backgrounds in order to get at their likely behavior regarding the immunization of their children. The virtue of high-inference measures is that, because their purpose is masked, it is difficult for the respondent to provide dishonest responses or to respond in the direction deemed desirable. On the other hand, in order to interpret the results from high-inference measures, we often must make quite tenuous inferential leaps. The less obvious the purpose of the items, the less likely that individuals will respond untruthfully, but the greater the required inference.

Because of the interpretation risks associated with high-inference assessment schemes, all newly-developed measures of affect in the handbook employ low-inference strategies. These self-report affective inventories sometimes rely on Likert-type scales wherein the respondent registers varying degrees of agreement/disagreement with statements regarding the affective dimension of interest. In other instances respondents are asked to estimate whether or not they would behave in a certain way (such as obtaining necessary immunization), then are told to indicate the degree of confidence which they have in each such estimate.

In general, it is assumed that a person's knowledge, affect, and skills contribute directly to that individual's behavior. And since most health education programs are ultimately interested in modifying participants' actual behaviors, then the acquisition of appropriate knowledge, affect, and skills can be seen as potentially precursive to the attainment of desired behavior. Thus, in evaluating health education programs that have not succeeded in achieving desired behavioral changes, it is often possible to detect shortcomings in the promotion of en route outcomes dealing with knowledge, skills, or affect.

Other Indicators of Effects

This handbook does not treat measures of health effects which might be used to determine whether health education programs are having their desired impact. Only the previously described behavioral, knowledge, affective, and skill measures have been included. These four categories certainly do not exhaust the range of possible assessment tools that evaluators should consider when they undertake an evaluation. There are numerous other sorts of extant data and assessment strategies which should be thought of as potentially helpful.

As an illustration of the sorts of existing data that evaluators often find useful, we can think of the numerous *archival* records of relevance to health behavior, e.g., immunization records. Such archival data can often prove illuminating in making decisions about health education programs. Evaluators must attempt to locate existing records of such phenomena if they pertain to the decisions under consideration.

More elaborate assessment strategies might also be used to measure health behaviors. We will briefly describe one technique, a procedure designed to secure responses to sensitive questions. The randomized response technique (RRT) is an effective technique for obtaining accurate information from respondents on a small number of highly sensitive issues such as the use of illegal drugs or alcohol. By presenting respondents with both a sensitive and a nonsensitive question, and by having respondents themselves use a random procedure (such as a coin flip) to select the "to be answered" question, respondents are expected to answer the sensitive question honestly because the interviewer can not know which question is actually being answered. An example of the nonsensitive question might be "Have you attended a PTA meeting at school during the past 12 months?" The sensitive question might ask, "Have you used heroin during the past 12 months?" An accurate estimate of the number of people responding "yes" to the sensitive question (e.g., the number of people reporting heroin use) can then be computed by subtracting the likely proportion of "yes" responses to the non-sensitive question.

Another assessment strategy involves the use of respondents as "informants" who report information about relatives, friends, etc. Often these reports can be made so that the individual about whom the report is made remains anonymous. This procedure, described as the _multiplicity technique_ by some and the _nominative technique_ by others, is described in more detailed elsewhere.[1]

Previously-Developed Measures

In addition to the development of new measures to coincide with high priority outcomes, an extensive effort was made to identify existing high quality measures which corresponded to these outcomes. This effort included a comprehensive computer search of seven data bases, recommendations of measures from panelists and panel-identified experts, and reviews of books, articles, and instruments submitted by panelists.

The computer search was conducted at the UCLA Biomedical Library using the following data bases: the Medline, ERIC (Educational Resources Information Center), Psychological Abstracts, Excerpta Medica, NIMH (National Institute of Mental Health), NCMH (National Clearinghouse for Mental Health), and SSIE (Smithsonian Science Information Exchange).

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[1] Fishborne, P. _Survey techniques for studying threatening topics: A case study in the use of heroin._ Unpublished doctoral dissertation, New York University, 1980.

In addition to input from the project panelists, area-specific experts and agencies identified during the project were sent summaries of the expert-panel meeting accompanied by a letter requesting assistance in the effort to locate existing measures and relevant publications.

Once collected, all measures were subjected to an initial content screening by an experienced reviewer. The purpose of this screening was to determine whether a measure corresponded to the panel-identified outcomes. Measures which satisfied the outcome congruence screening were then subjected to a further psychometric review. Prior to initiating the review of a measure's psychometric quality, however, the authors or agencies who developed the measure were contacted to request any available supporting documentation or relevant data about the instrument. In addition to being given an overview of the purpose of the project, authors were informed of the criteria to be used in the psychometric review in order to minimize the possibility that they might inadvertently fail to supply relevant data.

The primary criterion for inclusion in this handbook was, ultimately, degree of congruence with priority outcomes. Some measures of high quality had to be excluded because they did not possess sufficient correspondence with these outcomes to be of use to evaluators interested in assessing those outcomes. There are, in fact, several handbook outcomes for which no previously-developed measures have been included, primary because of a lack of existing measures targeted to those outcomes.

Test Specifications

For each of the measures developed for the handbook a set of test specifications was created to guide in the construction of the measure. As indicated in the previous chapter, this set of specifications operationalizes the outcome statement for which the measure serves as an indicator. The test specifications for all newly-developed measures are presented in Chapter Seven.

Evaluators and program personnel should find the test specifications of substantial utility, as these documents set forth in unequivocal terms the attributes being measured. This clarification of what is assessed should permit program personnel and evaluators to target their efforts more precisely to the program outcome as operationalized by the set of specifications. While one can employ the measures without referring to the specifications, most users of the measures will be markedly benefited by studying the set of specifications for each measure to be used. Program personnel in particular may want to consult the content supplements and the descriptions associated with many of the measures when planning their program itself.

The test specifications also permit program personnel to generate additional test items, if they so desire, by following the rules for item construction which have been set forth. Additional test items may be particularly useful in conjunction with knowledge and skill outcomes, where they can be employed during the course of a program as instructional tools and to monitor participant progress. Evaluators should realize, however, that any new measures created from the test specifications will not necessarily be equivalent forms, that is, forms equal in difficulty and other psychometric aspects to the forms presented in the handbook. Performance information on both the original form and any alternate forms would have to be gathered before the equivalence of such measures could be demonstrated. Therefore evaluators should be reluctant to use alternate forms as though they are equivalent, for example, in a pretest-posttest design.

To reiterate, then, in Chapters Five, Six, and Seven will be found, respectively, the newly developed measures, the existing measures, and the specifications for the newly developed measures. All of the outcomes upon which these measures are based are presented in Chapter Four. Each chapter is introduced with a brief description of that chapter's contents and an indication of the major descriptive headings contained therein. In Chapter Three suggestions are offered for using the measures in program evaluation.

CHAPTER THREE

HOW TO USE THIS HANDBOOK

Selecting Evaluation Measures

The measures that are selected for a program evaluation should correspond, as closely as possible, to outcomes of interest and importance to program personnel or other decision-makers associated with the program (e.g., the program's sponsoring agency). In some cases the measures may correspond directly to program goals. Other measures may be selected because they correspond to outcomes of ancillary interest. For example, if a program were focused on modifying participants' health behaviors, it might also be of interest to see if attitudinal changes also resulted from the program.

The desire to have a broad understanding of the impact of the program must be balanced with the need to avoid unnecessary use of program or evaluation resources. There are likely to be many interesting things about a program that one would like to know. But answering those questions requires the time and money of the program and, most likely, the time of program participants. Because personnel and financial resources are limited, and also because participants may come to resent what they consider to be unnecessary intrusions, measures should be selected carefully. An emphasis should be placed on using those measures that are likely to have implications for improving the program in the future.

One way to use the handbook is to determine the extent to which its outcome statements coincide with a program's stated objectives. Measures for those outcomes can then be considered as possible assessment devices to use in gauging the attainment of program objectives.

Another way to use the handbook is to consider its measures as reflecting possible outcomes that might be promoted by programs. As indicated earlier, program designers can create more effective programs if they comprehend clearly the nature of the targets at which the program is aimed. Although the sets of measures included in this handbook are far from exhaustive and certainly not prescriptive in any sense, they do represent a range of possible program aspirations. Furthermore, the measures are based on outcomes deemed important by a panel of experts well acquainted with health education programs in this field.

By reviewing all of the outcome measures in the handbook, at least by reading each measure's descriptor sheet, program designers and program evaluators can increase the range of options they may wish to consider as potential program outcomes.

Administration Procedures[1]

Evaluators need not develop special sets of directions in order to administer the measures that are presented in this handbook. Directions are provided with each measure, informing respondents how to supply the requested information. Test administrators should be sure to familiarize themselves with the directions and the measure itself before administering it. They can thus provide clear and accurate information to any requests for clarification by respondents.

Test administrators, whether or not they are program personnel, should be sensitive to the potential difficulty some respondents may have in reading either the directions or the test items themselves. Test administrators should be available to assist respondents as needed. It may be useful, if there is concern about the reading ability of the respondents, to read the directions aloud so as to ensure that all respondents understand what they are to do. If there is doubt about the ability of respondents to read the items, the items themselves on most measures can also be administered orally, either to groups of participants or to individuals. Respondents should be encouraged to ask questions if they do not understand their task or any items on a measure.

As a related issue, the measures do not require respondents to supply their names. This was done to help ensure the confidentiality of responses to potentially sensitive issues. If program evaluators believe that the integrity of the data would not be compromised by asking respondents to provide their names or other personal or demographic information, such information may be requested. Alternatively, if evaluators wish to be able to link performance on one measure to performance on another, this may be accomplished by assigning a code number to every individual and having the individual use that code designation whenever providing data. Respondents may also select their own identification code (e.g., mother's maiden name) if this would help alleviate fears about preserving confidentiality. In such cases, it is important that the same code be used consistently on all measures.

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[1] For additional information about administration procedures, see Annotated References Nos. 15 and 27.

The use of anonymously completed measures highlights a general concern associated with the administration of such measures in a program evaluation context. Test administrators should strive to create conditions in which respondents are genuinely comfortable in supplying truthful answers. Too often we find program personnel administering evaluation devices under circumstances which create subtle pressures for participants to respond in a manner satisfying to program staff. An effective evaluation, however, is based on honest responses, not socially desirable ones. Thus, all aspects of measure administration should be conducted with careful attention to the possible impact on participants' responses. For example, an external person rather than a member of the project staff could administer measures. Responses could also be collected anonymously, then placed in sealed envelopes in plain view of all participants. Other such techniques might be devised in order to elicit honest responses. Additional considerations related to possible response bias will be discussed later in this chapter.

Scoring

Scoring keys are provided for all newly-developed knowledge, skill, and affective measures. A more complete justification of the proposed scoring scheme associated with each newly-developed affective measure is also presented in its corresponding test specifications.

As a general rule, knowledge and skill measures are scored by computing the total number of correct responses. Affective measures are scored by computing the average response for a given measure. This procedure for affective measures simplifies interpretation of the obtained score (e.g., a respondent would obtain a score of 4.2 on a 5-point scale, rather than obtaining a score of, for example, 46 out of 55 points). It also reduces confusion in dealing with omitted responses.

On the newly-developed measures, higher scores are better. That is, higher scores on the cognitive measures (knowledge and skills) indicate that the respondents answered more items correctly. High scores on the affective measures indicate attitudes consistent with those promoted by the program (as set forth in the outcome description). A specific scoring key is not provided for behavioral measures, where it should be clear from the items themselves what the desired behavioral change should be.

In addition to considering performance of respondents on the total measure, items on some of the newly-developed affective measures are categorized to permit consideration of the different dimensions in the measure. Hence, part scores as well as total scores can be computed to provide a more in-depth analysis of participants' responses. Similarly, an analysis of incorrect responses is provided on selected skill measures to assist program personnel in determining the kinds of incorrect answers (distractors) that have been selected by examinees. By considering not only whether items were answered correctly, but also by looking for patterns in the incorrect responses, program personnel can often target the program towards reducing common misconceptions. Thus, by using the incorrect response analyses, program personnel may be able to infer why specific incorrect options were selected and also enhance program participants' understanding of the correct response by describing to them the flaws in frequently selected incorrect responses.

Missing data. One of the most frequent sources of confusion in scoring measures stems from the treatment of missing data. For purposes of this discussion we shall consider two types of missing data. The first type of missing data arises when a respondent does not answer certain items on a measure. The second type of missing data occurs when a respondent does not return a measure at all.

In the former case, suppose a respondent omits one or more items on a measure. Should the scorer infer that the respondent didn't read the item, didn't know the answer, or didn't understand the question? The way missing data are treated depends on the type of measure (cognitive, affective, or behavioral), the scoring procedures being used, and the judgment of the person responsible for data analysis. As a general guideline, one should try to treat missing data in a manner consonant with the most plausible assumption about why the data were omitted. A few examples may illustrate.

Blanks or omitted responses are often treated as incorrect responses for cognitive measures (i.e., those assessing knowledge and skill). Respondents' scores are then the sum of the correct responses, under the assumption that respondents would have marked an answer if they felt they knew it. If there are other more plausible assumptions about why a response was omitted, such as confusion about what the question was asking, this approach might not be advised. In that case, evaluators might consider missing and incorrect responses separately, thus creating a slight increase in the complexity of the analysis procedure.

The best procedure for dealing with missing affective responses should, again, be consistent with the general guideline of selecting the procedure that requires the fewest unsubstantiated assumptions about the missing responses. Consider the case in which respondents are asked to indicate the extent of their agreement with a series of statements on, for example, a 5-point Likert scale. Because a score on this measure is obtained by averaging the responses, missing data can usually be ignored, and the respondent's score can be computed based on the items for which there are responses. This assumes that the responses to the unanswered questions are, on average, the same as the responses to the questions that were answered. A different approach may be used if this assumption seems unwarranted. For example, if all the items of a particular type are omitted, it may be unwise to assume that the answers to those items would be the same as the answers to all the other items. In this case, the entire measure may have to be excluded from the analysis.

In affective measures on which respondents are required to estimate their confidence regarding a series of statements, similar procedures for treating missing responses can be used. Hence, in contrast to cognitive measures, respondents are typically not penalized for omitting responses on an affective measure.

There are no particularly useful procedures for dealing with missing data on behavioral measures that require respondents to answer a series of independent questions to describe their participation in health related activities. Each measure may need to be considered as a whole, with the evaluator or program personnel making an overall decision about whether the respondent engaged in adequately healthful activities or not. To the extent that the questions tap independent behaviors, there is no way to infer what the response to one item may be on the basis of responses to other items. (For example, if a child has received MMR, we cannot be sure that the child has received DTP.) Hence, decisions regarding missing data on behavioral measures must be made on a more individual basis. It is important, however, to employ consistent decision rules when dealing with any missing data.

The problem of how to deal with missing data when certain participants complete no items on selected measures is a more difficult one than the problem just addressed. That is, what can be done if, because the respondent either refused or was unavailable to complete the measure, we have no data at all regarding a given participant's status on a given outcome? The answer to this question depends on the data-gathering design that is being used and on the most likely reasons that the data were not obtained.

One of the more frequent contexts in which this problem arises is when a pretest-posttest design is used. In this design, measures are administered to program participants prior to beginning the program and, again, at the conclusion of the program. Observed changes between pretest and posttest scores are attributed to the impact of the program. But suppose that some participants do not complete the program and, therefore, are unavailable to complete the posttest questionnaires. Differences between the participants' average pretest scores and their posttest scores may come from systematic differences between the individuals who took the pretest and the individuals who completed the program, hence took the posttest. For example, suppose that, even before a program began, some participants had strong intentions to behave in a healthful way. Others did not. Now, suppose that a disproportionate number of those respondents who did not intend to behave in a healthful way dropped out of the program. If we considered the posttest responses of only those participants who remained in the program for its entire duration, while also considering the pretest responses of all the original participants, we would find that the posttest scores indicated stronger intentions to behave in a healthful way than pretest scores, even if the program had no effect on participants' intentions. This situation would arise because of the elimination of a disproportionate number of respondents who did not intend to change their behavior. Thus, observed changes might be due to differences in respondent characteristics rather than program impact.

To safeguard against this possibility, evaluators must be attentive to the characteristics of respondents, particularly when data at different points in time are compared. In the preceding example, it might be advisable to exclude the pretest data of those participants who did not provide posttest data, and to compute pretest and posttest means on the basis of those individuals for whom complete data exist. To do this would, of course, require using some unique and consistent identification code on all measures completed by each participant so that one could know whose pretest responses should be excluded. If it is necessary to eliminate a particular category of respondents from the analysis, one should be aware of the limitations this imposes on the ability to generalize the findings from the remaining respondents to the broader group of eligible participants. That is, in the preceding example we should only describe the effects of the program on participants who already intended to make the desired behavioral change (remember that a disproportionate number of other participants left the program), not on any person who might consider enrolling in this particular health education program.

The key issue in deciding what to do when individuals or groups of individuals fail to return selected measures is to determine the extent to which the non-respondents differ in any systematic way from the respondents. Are non-respondents less motivated initially? Do they vary on any major demographic variables, such as sex, ethnicity, or previous education? Are they more knowledgeable about the given health area than those who completed the measures? If the answer to any of these questions is yes, then it is important not to compare all pretest responses with all posttest responses. If, however, there appear to be no systematic differences between those respondents for whom complete data are available and those who did not return all measures, then it may be acceptable to consider all available data. This might be the case if, for example, several participants were sick on the day posttest measures were administered, but the absent respondents did not differ systematically from the other participants. Thus, the degree of attention to this type of missing data depends on the extent to which there is reason to suspect a systematic bias in the findings as a result of the missing information. At the very least, an evaluator should describe the characteristics of the participants who completed the measures at each administration period, so that those using the evaluation report can consider for themselves whether the assumptions guiding the treatment of missing data appear to be justified.

Interpreting Responses

It would be comforting to assume that the data, once collected and analyzed, provide accurate accounts of the respondents' cognitive, affective, and behavioral status. Unfortunately, however, there are many instances in which one cannot be certain that the inferences made from the data are fully justified. For example, in the cognitive areas we assume that the more items correctly answered by an individual, the more that the individual knows about the outcome being tested. But it is also possible, although in this case perhaps unlikely, that some respondents who were highly knowledgeable about the information being tested did not get a high score because they couldn't understand some of the items or had a hard time reading the test. It is the test developer's responsibility to try to reduce such confusion by, for example, ensuring that the items are written as simply as possible and that there are no extraneous sources of difficulty. It is the test user's responsibility to remember that there will inevitably be the potential for some confusion, and to interpret the measures in light of this potential.

This problem is probably more apparent in interpreting affective and behavioral measures. It has been well-documented that there are "response sets" or systematic sources of bias in responses to such measures. To illustrate, one of the best known response sets is social desirability, or the tendency of individuals to provide responses which are consistent with what they believe to be expected of them. So, for example, individuals might indicate that they intend to obtain immunizations because they believe that it is "appropriate" for them to do so, rather than because they actually have that intention. There is little that one can do to preclude completely the possibility of such response sets. To reduce at least somewhat the likelihood of response sets, evaluators can avoid language which clearly indicates the desired response, preserve the anonymity of respondents, and ensure respondents that the evaluation is more concerned with understanding the program than with describing selected participants. An atmosphere in which honesty rather than "proper behavior" is promoted is definitely conducive to obtaining accurate responses in sensitive areas.

This problem is, perhaps, even more pronounced in behavioral self-report measures, where respondents may misrepresent their behavior. Respondents may be reluctant to admit that they do not obtain immunizations for their children. Although the measures have been developed to encourage accurate responses, it is the responsibility of program personnel and evaluators to do all that they can to promote accurate responses and to minimize the threat of repercussions should individuals behave in undesirable ways. Guaranteeing anonymity is one common procedure, but establishing credibility with respondents is also critical. In addition, procedures such as the randomized response technique may be used to verify the accuracy of behavioral self-reports.

The problem is not as overwhelming as it may sound. Clearly, whenever one must rely on self-report data there is the possibility of inaccurate responses. But careful measure development can reduce the degree of perceived threat in the measures and this can promote honesty. Furthermore, program personnel can help allay the anxiety of respondents so as to increase honesty of responses. Corroboration, or the threat of corroboration, by an external source can reduce the likelihood that respondents will bias their responses. In addition, many designs compare responses at one point in time to responses at another, or compare different groups of respondents to each other. In these comparative designs, whatever systematic bias there is may be found at all measurement times and, hence, may not influence indices of change. Finally, by being aware that such problems may exist, those who use evaluation measures can encourage caution in interpreting evaluation findings and urge verification of data where it is warranted.

Enriching Evaluations

This handbook provides measures that may be useful in assessing a program's outcomes. Typically, a health educator might select not merely one but several measures to use in a program evaluation. Multiple outcome measures can markedly enhance the quality of an evaluation.

Although the outcomes measured in the handbook have been deemed important, they may not coincide directly with the outcomes of interest to any given program. And they certainly do not exhaust the issues that may be of interest to those individuals involved in a program. Program evaluators and personnel should not limit their data-gathering efforts to the measures provided in this handbook. Rather they should supplement these measures with others that more directly address the particulars of the evaluation settings in which they find themselves.

The emphases of any supplementary evaluation activities should coincide with the information needs and interests of those concerned with the program. Probably the most useful information elicits ways to enhance the effectiveness of the program, either as it has already been implemented or as it will be carried out in similar programs planned for the future. For example, questionnaires may be administered to program participants asking them to identify any follow-up support or information they might need in order to maintain an appropriate immune status. Participants might also be able to provide specific suggestions for improvement of the program should it be offered to others.

It is impossible to isolate all the information that might be useful to gather for an evaluation. But the following point cannot be overstated: *Evaluations should focus on the systematic collection of data that can be used to improve the quality of health education programs* and, in turn, the physical and psychological well-being of participants and of the community at large. Evaluation should not be conducted for the sake of evaluation but should be viewed as a tool to enhance the effectiveness of health education programs. It can only fulfill this promise if those guiding the evaluative efforts direct evaluation resources with this goal in mind, and if they use their resources wisely. The measures that comprise the majority of this handbook should provide a solid foundation for effective evaluation efforts. But program personnel and evaluators in the field must structure evaluations to serve the needs of those with a stake in the findings, and their professional insights are likely to be the best guide possible.

Using Unproven Measures

In the remainder of this handbook there are numerous measures available for use by evaluators of health education programs. The measures developed specifically for this project, as well as some of the already existing measures included here, share one substantial shortcoming. They have not been subjected to rigorous empirical investigations to ascertain their psychometric qualities, especially their reliability and validity. When using such measures, how should program evaluators proceed? The answer is all too clear--with great caution.

Although all of the measures included in the handbook were developed with substantial care, until there have been reliability and validity studies carried out which verify those measures' technical adequacy, they should be employed with substantial care. To illustrate, in the absence of reliability and validity data, one should be most reluctant to draw inferences about the meaningfulness of an individual's score on particular measures.

In using measures for purposes of program evaluation, we often aggregate results for a group of participants rather than try to work with individual participants' responses. By using the pooled responses of many individuals, we can have more confidence in the average of the group since anomalous scores will either tend to cancel each other out or be outweighed by the total set of responses. Even with such aggregated scores, however, care is warranted when using measures whose reliability and validity have not been empirically confirmed.

The general caveat regarding the use of measures which have not yet been subjected to empirical analysis is for program evaluators to proceed very carefully in employing such assessment instruments. The new measures that are included in Chapter Five of the handbook were developed with great care, employing a variety of internal and external review procedures to assure that their content and form was appropriate. Yet, although one can have confidence that the process used in their development was systematic and thoughtful, the opportunity to subject those measures to empirical verification has not yet arisen. Such an appraisal of the new measures' technical adequacy is planned for the future. It is likely that the handbook's measures may be superior to the hastily created measures seen so often in the evaluation of health education programs. Nonetheless, evaluators of health education programs should regard the handbook's measures as a resource to be used--but to be used with prudence.

CHAPTER FOUR

PROGRAM OUTCOME STATEMENTS

The outcomes presented in this chapter are program evaluation goals identified by a panel of subject matter and health education experts selected as advisors for this project. The panelists identified two major behavioral outcomes, namely, parents and guardians' maintenance of appropriate immune status for their children and immunization providers' immunization of unprotected populations. Knowledge, skill, and affective outcomes considered likely to predispose individuals to adopt these target behaviors were also selected. The process by which these outcomes were isolated and put in priority order is explained more completely in the Preface to the handbook.

This chapter's program outcome statements have guided the development of the rest of the handbook. Chapter Five presents newly-developed measures designed to assess each outcome. Chapter Six contains previously-developed measures selected for their congruence with the outcome statements. Chapter Seven consists of test specifications for all the newly-developed measures. These specifications define the outcomes, describing the precise nature of each one.

The outcome statements that follow are relatively brief definitions of a particular behavior, knowledge, skill, or attitude considered important for immunization health education programs. The title of each outcome statement is used throughout the handbook to reference the measures corresponding to it. As a further aid to handbook users, the outcome statements presented in this chapter are accompanied by the titles of the measures that correspond to each one. The target population for each measure is also noted. Handbook users can locate the measures for each outcome on the page specified.

BEHAVIORAL OUTCOMES

MAINTENANCE OF APPROPRIATE IMMUNE STATUS

Parents or guardians who are responsible for the immunization status of children maintain that status on an up-to-date basis.

Immunization Survey . . . . page 53

Target population: Parents or Guardians

Immunization Record . . . . page 113

Target population: Parents or Guardians

Immunization Record Card . . . . page 115

Target population: Parents or Guardians

IMMUNIZATION OF UNPROTECTED POPULATIONS

Immunization providers immunize unprotected populations. This includes locating, immunizing, and maintaining immunization records for unprotected persons within providers' area of responsibility.

California Immunization Baby Track . . . . page 117

Target population: Immunization providers

KNOWLEDGE OUTCOMES

NATURE OF COMMUNICABLE DISEASES

Individuals can accurately recall information about the characteristics, incidence, and effects of communicable diseases.

Communicable Diseases . . . . page 56

Target population: Adults or Adolescents

Nature of Communicable Diseases . . . . page 60

Target population: Immunization providers

IMMUNIZATION REQUIREMENTS AND GUIDELINES

Individuals can accurately recall information about immunization requirements and guidelines.

Immunization Information . . . . page 64

Target population: Adults or Adolescents

APPROPRIATE IMMUNIZATION PRACTICE

Immunization providers can accurately recall information about appropriate immunization practice.

Immunization Guidelines . . . . page 68

Target population: Immunization providers

SKILL OUTCOMES

STORAGE, PREPARATION, AND ADMINISTRATION OF VACCINES

Immunization providers can choose appropriate actions for the storage, preparation, and administration of vaccines.

Handling Vaccines . . . . page 72

Target population: Immunization providers

IMMUNIZATION AND CONTRAINDICATIONS

Immunization providers can determine whether it is appropriate to immunize an individual.

Deciding Whether to Immunize . . . . page 79

Target population: Immunization providers

AFFECTIVE OUTCOMES

BELIEF IN THE IMPORTANCE OF IMMUNIZATION

Individuals view susceptibility to communicable diseases as serious, recognize the benefits of immunization, and realize the value of maintaining immunization records.

Ideas About Immunization . . . . page 86

Target population: Adults or Adolescents

Think About Immunization . . . . page 90

Target population: Elementary school children

INTENTION TO OBTAIN IMMUNIZATION

Individuals intend to obtain immunization even if faced with situations which might present barriers to being immunized.

Would you Obtain Immunization? . . . . page 93

Target population: Adults or Adolescents

INTENTION TO HAVE CHILDREN IMMUNIZED

Individuals intend to obtain immunization for their children even if faced with situations which might present barriers to such immunization.

Immunization for Children . . . . page 97

Target population: Parents or Guardians

INTENTION TO MAINTAIN IMMUNIZATION RECORDS

Individuals intend to maintain immunization records for themselves and for their children, even if faced with situations that might present barriers to maintaining those records.

Keeping Track . . . . page 101

Target population: Adults or Adolescents

INTENTION TO BRING IMMUNIZATION RECORD CARDS FOR CHILDREN

Individuals intend to bring their children's immunization records with them whenever they bring their children for health care.

Bringing Records for Your Child . . . . page 105

Target population: Parents or Guardians

RESPECT FOR ONE'S BODY

Individuals are willing to engage in those activities that are indicative of a respect for their body and the need to take care of it.

My Body . . . . page 109

Target population: Elementary school children

CHAPTER FIVE

MEASURES DEVELOPED FOR THIS PROJECT

This chapter contains all of the measures that have been newly developed to correspond to the program outcome statements listed in Chapter Four. The measures are presented in the same order as the outcome statements, that is, the behavioral measure is followed by measures of knowledge, skill, and affect.

A descriptor page precedes each measure. This page indicates the type of measure (behavioral, knowledge, skill, or affective), the title of the outcome assessed, and the target population for the instrument. A general description is presented, providing an overview of the assessment strategy employed in the measure. Finally, the pages in the handbook where the test specifications for the measure can be found are also cited.

All of the measures in this chapter have been readied for possible photocopying, with directions to respondents printed at the top of the first page of each instrument. Scoring instructions follow all knowledge, skill, and affective measures.

IMMUNIZATION SURVEY

TYPE OF MEASURE: Behavioral

OUTCOME ASSESSED: Maintenance of Appropriate Immune Status

TARGET POPULATION: Parents or Guardians

GENERAL DESCRIPTION:

Individuals are asked about the immunization status of any children under their charge. This information can be used as a measure of how effective an immunization program is in ensuring that children are immunized against polio, diphtheria, tetanus, pertussis, measles, mumps, and rubella.

ADDITIONAL INFORMATION:

Test specifications for this measure can be found on pages 120-122.

IMMUNIZATION SURVEY

This surveys asks about the immunization history of your child. If you have a written record of your child's immunizations, available on an immunization record card or from your doctor or clinic, please use that record in completing the survey.

1. Child's Date of Birth: ______________________
   month day year

2. Does your child have an exemption from immunization requirements?

   ____ Yes (Please indicate type: ________________)
   ____ No

The chart on the next page lists several vaccines. For each vaccine that your child has received, write the month, day, and year that each dose was administered. Put a check in the column labeled "Never Administered" if there is no record that the vaccine was given.

Be sure to make an entry for each vaccine listed. Either indicate at least one administration date or put a check in the "Never Administered" column.

Immunization Survey
Page 2

Vaccine	Date Vaccine Administered					Never Administered
	Dose 1	Dose 2	Dose 3	Dose 4	Dose 5	
Polio (OPV/IPV)*						
DTP**						
Measles***		╳	╳	╳	╳	
Mumps***		╳	╳	╳	╳	
Rubella***		╳	╳	╳	╳	

* Circle the specific polio vaccine given.

** DTP is the combined vaccine for diphtheria, tetanus, and pertussis.

*** These vaccines may be given in a combined form identified as MMR.

3. Where did you get the information you used to complete the chart above?

___ From my child's Immunization Record Card
___ From my child's doctor or clinic records
___ From my child's baby book
___ Other (Please indicate where: ________________)

COMMUNICABLE DISEASES

TYPE OF MEASURE: Knowledge

OUTCOME ASSESSED: Nature of Communicable Diseases

TARGET POPULATION: Adults or Adolescents

GENERAL DESCRIPTION:

Individuals are presented with statements about the following communicable diseases: diphtheria, tetanus, pertussis (whooping cough), measles, mumps, rubella, and polio. Individuals indicate whether each statement is true or false.

ADDITIONAL INFORMATION:

Test specifications for this measure can be found on pages 123-130.

COMMUNICABLE DISEASES

This test consists of 20 statements about communicable diseases. Some of the statements are true and some are false. If you think a statement is true, put a check in the column labeled TRUE. If you think a statement is false, put a check in the column labeled FALSE.

TRUE FALSE

____ ____ 1. Diphtheria is a viral infection.

____ ____ 2. Adults who have not had mumps or the vaccine and who are around someone with mumps should see a doctor immediately.

____ ____ 3. Polio causes death in twenty percent of all cases.

____ ____ 4. Mumps is most common in the elderly.

____ ____ 5. The nervous system can be affected by diphtheria.

____ ____ 6. Ten percent of all diphtheria cases result in death.

____ ____ 7. Tetanus affects the nervous system.

____ ____ 8. Measles usually lasts for 15 days.

____ ____ 9. Tetanus causes death in two-thirds of all cases.

____ ____ 10. Tetanus may cause convulsions.

____ ____ 11. Rubella can lead to swollen glands.

____ ____ 12. Pertussis (whooping cough) is a communicable viral infection.

____ ____ 13. Any size wound may become a tetanus problem.

TRUE	FALSE	
____	____	14. Polio can lead to paralysis of the arms.
____	____	15. Measles during pregnancy may lead to premature birth.
____	____	16. Measles can lead to pneumonia.
____	____	17. Pertussis (whooping cough) is characterized by mild coughing.
____	____	18. Measles is one of the most serious of the common childhood diseases.
____	____	19. Rubella is most dangerous to pregnant women in the last three months of their pregnancy.
____	____	20. Mumps is a communicable bacterial infection.

SCORING KEY

COMMUNICABLE DISEASES

Item	Answer
1	F
2	T
3	F
4	F
5	T
6	T
7	T
8	F
9	F
10	T
11	T
12	F
13	T
14	T
15	T
16	T
17	F
18	T
19	F
20	F

NATURE OF COMMUNICABLE DISEASES

TYPE OF MEASURE: Knowledge

OUTCOME ASSESSED: Nature of Communicable Diseases

TARGET POPULATION: Immunization providers

GENERAL DESCRIPTION:

Immunization providers are presented with statements about the following communicable diseases: diphtheria, tetanus, pertussis, measles, mumps, rubella, and polio. Immunization providers indicate whether each statement is true or false.

ADDITIONAL INFORMATION:

Test specifications for this measure can be found on pages 131-138.

NATURE OF COMMUNICABLE DISEASES

This test consists of 20 statements about communicable diseases. Some of the statements are true and some are false. If you think a statement is true, put a check in the column labeled TRUE. If you think a statement is false, put a check in the column labeled FALSE.

TRUE FALSE

____ ____ 1. Diphtheria is a communicable viral infection.

____ ____ 2. The attack of the nervous system by the polio virus results in only temporary paralysis.

____ ____ 3. Polio causes death in 20% of all cases.

____ ____ 4. Measles during pregnancy has no effect on birth weight.

____ ____ 5. Polio is a viral infection.

____ ____ 6. Only large wounds should be considered potential tetanus infections.

____ ____ 7. Rubella is a communicable viral disease.

____ ____ 8. Mumps is a bacterial infection.

____ ____ 9. The risk of death from measles is higher for children and adolescents than for infants and adults.

____ ____ 10. Measles usually last for about 10 days.

____ ____ 11. In the United States, death occurs in approximately 1 out of every 1000 reported measles cases.

____ ____ 12. Approximately 1 out of every 1000 cases of measles develops into encephalitis.

TRUE FALSE

____ ____ 13. Pertussis causes inflammation of the respiratory passages.

____ ____ 14. Pertussis is a communicable viral disease.

____ ____ 15. Orchitis has been reported as a complication in up to 20% of mumps cases in post-pubertal males.

____ ____ 16. The majority of reported cases of mumps occur in children.

____ ____ 17. Diphtheria causes death in 20% of all cases.

____ ____ 18. Tetanus causes death in approximately two-thirds of all cases.

____ ____ 19. Ear infections may develop as a result of pertussis.

____ ____ 20. Tetanus may produce spasms in the back muscles.

SCORING KEY

NATURE OF COMMUNICABLE DISEASES

Item	Answer
1	F
2	F
3	F
4	F
5	T
6	F
7	T
8	F
9	F
10	T
11	T
12	T
13	T
14	F
15	T
16	T
17	F
18	F
19	T
20	T

IMMUNIZATION INFORMATION

TYPE OF MEASURE: Knowledge

OUTCOME ASSESSED: Immunization Requirements and Guidelines

TARGET POPULATION: Adults or Adolescents

GENERAL DESCRIPTION:

Individuals are presented with statements about immunization for communicable diseases. Individuals indicate whether each statement is true or false.

ADDITIONAL INFORMATION:

Test specifications for this measure can be found on pages 139-147.

IMMUNIZATION INFORMATION

This test consists of 20 statements about immunization. Some of the statements are true and some are false. If you think a statement is true, put a check in the column labeled TRUE. If you think a statement is false, put a check in the column labeled FALSE.

TRUE FALSE

___ ___ 1. Children who have not received all the shots in the DTP series only need to make up the shots that they have missed.

___ ___ 2. A child with a fever of more than 103°F should be immunized immediately.

___ ___ 3. Combined vaccines protect a person from several different diseases.

___ ___ 4. People should get a tetanus booster shot every 15 years.

___ ___ 5. DTP vaccinations should be given five times during the first year of life.

___ ___ 6. Oral Polio Vaccine (OPV) should be given only once, in a single dose.

___ ___ 7. Pregnant women should be given the MMR (measles, mumps, and rubella) vaccine.

___ ___ 8. Side effects from vaccines usually develop six weeks after vaccination.

___ ___ 9. Children who have had the single rubella vaccine can be given MMR vaccine for measles and mumps.

___ ___ 10. Single vaccines protect an individual from one disease.

___ ___ 11. Immunization for tetanus produces no known side effects.

TRUE FALSE

____ ____ 12. Whenever one brings a child to a doctor's office, the child's immunization record card should also be brought.

____ ____ 13. Parents should keep written immunization records for their children.

____ ____ 14. The Inactivated Polio Vaccine (IPV) is the polio vaccine of choice for children who have never been immunized.

____ ____ 15. More than 90% of persons receiving one dose of the mumps vaccine will be protected.

____ ____ 16. Side effects from vaccines are more common when the vaccine is given in combined form than when it is given in single form.

____ ____ 17. In most states, proof of immunization is required by law to register children for school.

____ ____ 18. Fever is rare after a vaccination against mumps.

____ ____ 19. Individuals who become drowsy after their first DTP shot need no special treatment if given later injections.

____ ____ 20. Rubella vaccine usually causes a rash.

SCORING KEY

IMMUNIZATION INFORMATION

Item	Answer
1	T
2	F
3	T
4	F
5	F
6	F
7	F
8	F
9	T
10	T
11	T
12	T
13	T
14	F
15	T
16	F
17	T
18	T
19	F
20	F

IMMUNIZATION GUIDELINES

TYPE OF MEASURE: Knowledge

OUTCOME ASSESSED: Appropriate Immunization Practice

TARGET POPULATION: Immunization providers

GENERAL DESCRIPTION:

Immunization providers are presented with statements about appropriate immunization practice. Immunization providers indicate whether each statement is true or false.

ADDITIONAL INFORMATION:

Test specifications for this measure can be found on pages 148-158.

IMMUNIZATION GUIDELINES

This test consists of 20 statements about immunization. Some of the statements are true and some are false. If you think a statement is true, put a check in the column labeled TRUE. If you think a statement is false, put a check in the column labeled FALSE.

TRUE FALSE

____ ____ 1. A complete diphtheria immunization protects an individual for approximately 10 years.

____ ____ 2. The DTP vaccine should be given on six occasions.

____ ____ 3. Exposure of single measles vaccine to light before reconstitution will destroy the vaccine.

____ ____ 4. IPV has several severe side effects.

____ ____ 5. The OPV series consists of five primary doses and a supplementary dose.

____ ____ 6. The DTP vaccine should always be given intra-muscularly.

____ ____ 7. MMR vaccine should be reconstituted with the diluent supplied by the manufacturer of the vaccine.

____ ____ 8. 40% of all children immunized against measles may develop a mild fever within 10 days of vaccination.

____ ____ 9. Once opened, polio vaccine must be used within seven days.

____ ____ 10. DTP, OPV, and MMR should never be given to the same person at the same time.

____ ____ 11. MMR vaccine should not be given for six months after a patient has received Immune Serun Globulin (ISG).

TRUE FALSE

____ ____ 12. All immunizations should be recorded on a patient's state-authorized immunization record card.

____ ____ 13. All immunization providers should be aware of the symptoms of reactions to vaccines.

____ ____ 14. Patients with immune deficiency diseases should be given MMR vaccine.

____ ____ 15. MMR vaccine should optimally be given at the age of 15 months.

____ ____ 16. Routine polio immunization of adults 18 years of age or older is necessary.

____ ____ 17. One out of every several million individuals who receive OPV develops paralysis.

____ ____ 18. Persons born after 1957 are considered to be immune to mumps.

____ ____ 19. Post-exposure immunization is likely to prevent the development of rubella.

____ ____ 20. MMR vaccine should not be given to pregnant females.

SCORING KEY
IMMUNIZATION GUIDELINES

Item	Answer
1	T
2	F
3	T
4	F
5	F
6	T
7	T
8	F
9	T
10	F
11	F
12	T
13	T
14	F
15	T
16	F
17	T
18	F
19	F
20	T

HANDLING VACCINES

TYPE OF MEASURE: Skill

OUTCOME ASSESSED: Storage, Preparation, and Administration of Vaccines

TARGET POPULATION: Immunization providers

GENERAL DESCRIPTION:

Immunization providers are presented with descriptions of situations in which a health care provider must either store, prepare, or administer a vaccine. Immunization providers are asked to select the best course of action from among four possible options. The correct action will be consistent with accepted standards for the storage, preparation, and administration of specific vaccines.

ADDITIONAL INFORMATION:

Test specifications for this measure can be found on pages 159-163.

HANDLING VACCINES

This test presents situations in which health care providers must store, prepare, or administer various vaccines.

Read each description. Then circle the letter of the best action for the person to take.

1. Daniel Brook removed a vial of DTP vaccine which had been in the refrigerator for 12 months, in order to prepare the vaccine for administration. The best action for Daniel to take is to:

   A. Shake the vial well before administering the vaccine.

   B. Reconstitute the vaccine with diluent.

   C. Prepare the vaccine for intravenous administration.

   D. Dispose of the vaccine.

2. A shipment of polio vaccine was received at a clinic and placed in a storage room. Esther Carusi discovered the vaccine several hours after its arrival and found that it was at room temperature 25°C (78°F). The best action for Esther Carusi to take is to:

   A. Freeze the vaccine at -10°C (14°F) or lower for use within 12 months.

   B. Refrigerate the vaccine at 2° to 8°C (35° to 46°F) for use within 30 days.

   C. Continue to store the vaccine at room temperature for use within 24 hours.

   D. Dispose of the vaccine.

3. Curtis Terry received a shipment of DTP vaccine which had been unrefrigerated for two hours on Thursday. The vaccine is to be used on the following Wednesday. The best action for Curtis to take is to:

   A. Store the vaccine in the door of a refrigerator.

   B. Freeze the vaccine.

   C. Refrigerate the vaccine at 2° to 8°C (35° to 46°F).

   D. Dispose of the vaccine.

4. Ray Davis has reconstituted enough MMR vaccine for use during the day and now must store it. The best action for Ray to take is to:

   A. Store the vaccine in a dark container at 2° to 8°C (35° to 46°F).

   B. Store the vaccine in a dark container at 25°C (77°F).

   C. Store the vaccine in a clear container at 2° to 8°C (35° to 46°F).

   D. Store the vaccine in a clear container at 25°C (77°F).

5. Jackie Leonard discovers a vial of reconstituted MMR vaccine in the refrigerator. The vaccine was prepared for the prior day's vaccinations. The best action for Jackie to take is to:

   A. Freeze the vaccine for use within 30 days.

   B. Refrigerate the vaccine for use within 7 days.

   C. Administer the remaining vaccine within 8 hours.

   D. Dispose of the vaccine.

6. Alan Dobs discovered a batch of frozen polio vaccine which had been previously thawed for 18 hours. He had planned on using the vaccine for an all day polio vaccination clinic. The best action for Alan to take is to:

   A. Use the vaccine for no more than 5 hours and then refreeze the remaining unopened vaccine.

   B. Use the vaccine for no more than 12 hours and then refreeze the remaining unopened vaccine.

   C. Use the vaccine for no more than 24 hours and then refreeze the remaining unopened vaccine.

   D. Dispose of the vaccine.

7. Pam Bryant is preparing to administer OPV to a patient. The best action for Pam to take is to:

   A. Administer the vaccine intramuscularly.

   B. Administer the vaccine subcutaneously.

   C. Administer the vaccine orally.

   D. Administer the vaccine intravenously.

8. On June 5 of this year Kim Jones removes 50 doses of DTP vaccine from the refrigerator. The marked expiration date on the vaccine is December of the same year. The best action for Kim to take is to:

   A. Freeze the vaccine for use within the next 12 months.

   B. Refrigerate the vaccine for use by December.

   C. Refrigerate the vaccine for use within the next 12 months.

   D. Dispose of the vaccine.

9. Ron Goldstein requires three doses of MMR. He has 10 doses of unreconstituted vaccine from manufacturer A and enough diluent from manufacturer A to reconstitute one dose of MMR. However, there is enough diluent from manufacturer B for three doses. The best action for Ron to take is to:

   A. Combine the diluent from manufacturer A and B and reconstitute three doses.

   B. Reconstitute one dose of vaccine from manufacturer A with diluent from manufacturer A.

   C. Reconstitute one dose of vaccine from manufacturer A with diluent from manufacturer A and two doses of vaccine from manufacturer A with diluent from manufacturer B.

   D. Reconstitute three doses of vaccine from manufacturer A with diluent from manufacturer B.

10. Dave Macky discovers a stock of DTP vaccine which has been in the freezer for four months. The best action for Dave to take is to:

    A. Thaw the vaccine for use.

    B. Store the vaccine at 2° to 8°C (35° to 46°F).

    C. Reconstitute the vaccine.

    D. Dispose of the vaccine.

11. At the end of the day, Linda Savage had polio vaccine left from the supply which had been thawed and opened for the first time that day. The best action for Linda to take is to:

    A. Refrigerate the vaccine.

    B. Freeze the vaccine.

    C. Store the vaccine at 25°C (77°F).

    D. Dispose of the vaccine.

12. During a training period at a new immunization clinic, Mark Smith must administer a dose of MMR vaccine. The best action for Mark to take is to:

    A. Administer the vaccine intramuscularly.

    B. Administer the vaccine subcutaneously.

    C. Administer the vaccine orally.

    D. Administer the vaccine intravenously.

13. Maria Rodriguez receives a shipment of MMR vaccine which has been refrigerated at 2°C (35°F). The best action for Maria to take is to:

    A. Reconstitute the vaccine for use the following week.

    B. Store the vaccine in a refrigerator door.

    C. Use the vaccine within two years.

    D. Dispose of the vaccine.

14. Gwen Metz has prepared a dose of DTP vaccine and is ready to administer it. The best action for Gwen to take is to:

    A. Administer the vaccine intramuscularly.

    B. Administer the vaccine subcutaneously.

    C. Administer the vaccine orally.

    D. Administer the vaccine intravenously.

15. Vickie Mendoza receives an air mail shipment of OPV packed in dry ice. The vaccine has thawed in shipment, but its temperature did not exceed 4°C (39°F). The best action for Vickie to take is to:

    A. Refreeze the vaccine.

    B. Open the vaccine to check for contamination.

    C. Store in the refrigerator at 2° to 8°C (35° to 46°F) for use within two months.

    D. Dispose of the vaccine.

SCORING KEY
HANDLING VACCINES

Item	Answer
1	A
2	D
3	C
4	A
5	D
6	A
7	C
8	B
9	B
10	D
11	A
12	B
13	C
14	A
15	A

INCORRECT ANSWER CHOICE ANALYSES

The incorrect answer choices for each item are listed below using the following method of annotation:

Always Inappropriate = A response that is inappropriate for any vaccine.

Inappropriate for Specified Vaccine = A response that is inappropriate for the specified vaccine.

Inappropriate Disposal = Disposing of an uncontaminated or active vaccine.

Item	Always Inappropriate	Inappropriate for Specified Vaccine	Inappropriate Disposal
1	C	B	D
2	A, C	B	
3	A	B	D
4	B, D	C	
5		A, B, C	
6		B, C	D
7	D	A, B	
8	C	A	D
9		A, C, D	
10		A, B, C	
11	C	B	D
12	D	A, C	
13	B	A	D
14	D	B, C	
15	B	C	D

DECIDING WHETHER TO IMMUNIZE

TYPE OF MEASURE: Skill

OUTCOME ASSESSED: Immunization and Contraindications

TARGET POPULATION: Immunization providers

GENERAL DESCRIPTION:

Immunization providers are presented with descriptions of individuals who have come for immunizations. Immunization providers are asked to decide whether it is appropriate or contraindicated to immunize each individual.

ADDITIONAL INFORMATION:

Test specifications for this measure can be found on pages 164-167.

DECIDING WHETHER TO IMMUNIZE

This test presents descriptions of people under your regular care who are seeking immunization. If you think that it is appropriate to immunize an individual, check YES. If you think that is contraindicated for the individual, check NO.

1. Tim's father brings his son to the doctor's office for his second DTP vaccine. Tim has been healthy since he received his first DTP vaccine six weeks ago at age six months, and there have been no observed adverse reactions to the vaccine. Tim's older sister is suffering from leukemia. Is it appropriate to give Tim DTP vaccine?

____ Yes
____ No

2. Mrs. Abbot brings her healthy six-year-old son Ted in for his first DTP vaccine. He is healthy, as are all other members of his family. Is it appropriate to give Ted DTP vaccine?

____ Yes
____ No

3. John's mother brings him to the clinic for his first DTP vaccine. John is a healthy five-week-old infant. Is it appropriate to give John DTP vaccine?

____ Yes
____ No

4. Mrs. Percy brings her healthy two-year-old daughter Elaine to the clinic for her third OPV dose. Elaine experienced no adverse reaction to her second OPV dose four weeks ago. Is it appropriate to give Elaine OPV vaccine?

____ Yes
____ No

5. Gail is a healthy five year old who comes to the clinic with her mother for her first Td shot. Is it appropriate to give Gail Td vaccine?

____ Yes

____ No

6. Victor's mother brings him to the clinic for his first OPV dose. Victor is a healthy five week old. Is it appropriate to give Victor OPV vaccine?

____ Yes

____ No

7. On the first day of school the school nurse discovers that Eric has not had an MMR vaccine. Eric is six years old and has a mild cold. Is it appropriate to give Eric MMR vaccine?

____ Yes

____ No

8. Robert's mother has brought him to the clinic for his last OPV vaccine. Robert is healthy, five years old, and has experienced no adverse reactions to OPV. He has an older brother who is receiving drug therapy for a malignancy. Is it appropriate to give Robert OPV vaccine?

____ Yes

____ No

9. Brenda, who is eight years old, goes to the special immunization clinic at her school for her second Td shot. She received her first Td shot five weeks ago. Brenda is currently healthy. Is it appropriate to give Brenda Td vaccine?

____ Yes

____ No

10. Mrs. Peterson brings her healthy eight-month-old son David to the doctor's office for his second DTP vaccine. After talking to Mrs. Peterson, the nurse discovers that David developed a fever of 100°F and a cough six days after being vaccinated for DTP two months ago. Is it appropriate to give David DTP vaccine?

____ Yes
____ No

11. Three weeks ago Albert's mother brought her son to the clinic for his first DTP vaccine. She has brought him back for his second vaccine. Albert is three months old and healthy. He experienced no adverse reactions to the first vaccine. All other members of Albert's family are healthy. Is it appropriate to give Albert DTP vaccine?

____ Yes
____ No

12. While filling out a job application, Gwen discovers that she never received her last OPV dose. She therefore goes to the clinic and request an OPV vaccine. Gwen is a healthy, non-pregnant, 20-year-old woman. Is it appropriate to give Gwen OPV vaccine?

____ Yes
____ No

13. Lois is a healthy eighteen-month-old child who is brought to the clinic for her fourth DTP vaccine. Her mother reports that Lois had no adverse reaction to her third DTP vaccine which was given eight months ago. Is it appropriate to give Lois DTP vaccine?

____ Yes
____ No

14. Larry, who is eight years old, cut himself on a nail on his way to school. When he reached school, Larry went to the school nurse. In checking Larry's records, the nurse found that Larry had received his preschool DTP booster two years ago and had had no adverse reactions to the shot. Is it appropriate to give Larry Td vaccine?

____ Yes
____ No

15. Two-year-old Valerie is brought to the clinic for her MMR vaccine. In checking her medical history, the nurse discovers that Valerie is receiving radiation therapy for bone cancer. Is it appropriate to give Valerie MMR vaccine?

____ Yes
____ No

16. Joy's mother has brought her three-month-old healthy daughter back to the clinic for her second DTP vaccine. Joy received her first DTP vaccine six weeks ago and developed a fever of 104°F that same evening. Is it appropriate to give Joy DTP vaccine?

____ Yes
____ No

17. Linda's immunization record card shows that she received her third DTP vaccine six months ago, that she is ten months old, and that she has had no adverse reactions to the vaccine. Linda's mother indicates that Linda has not been ill for the past month. Is it appropriate to give Linda DTP vaccine?

____ Yes
____ No

18. Donald's mother has brought him to the clinic for his second OPV dose. His immunization record shows that he is two years old, that he received his first OPV dose four months ago, and that he had no adverse reaction to the dose. He appears to be healthy at present. Is it appropriate to give Donald OPV vaccine?

____ Yes
____ No

19. Mrs. Garcia brings her four-year-old son Fernando in for his last DTP vaccine. Fernando has had a fever of 100°F for the last 24 hours. He has no history of past reactions to DTP vaccines. Is it appropriate to give Fernando DTP vaccine?

____ Yes
____ No

20. Sharon is 18 months old and has been brought to the clinic for her MMR vaccine. She is healthy, though she did receive Immune Serum Globulin (ISG) four months ago. Is it appropriate to give Sharon MMR vaccine?

____ Yes
____ No

SCORING KEY

DECIDING WHETHER TO IMMUNIZE

Item	Answer
1	Yes
2	Yes
3	No
4	No
5	No
6	No
7	Yes
8	No
9	Yes
10	Yes
11	No
12	Yes
13	Yes
14	No
15	No
16	No
17	No
18	Yes
19	Yes
20	Yes

IDEAS ABOUT IMMUNIZATION

TYPE OF MEASURE: Affective

OUTCOME ASSESSED: Belief in the Importance of Immunization

TARGET POPULATION: Adults or Adolescents

GENERAL DESCRIPTION:

This inventory is a Likert scale in which respondents are asked to register their degree of agreement with a series of statements about the importance of immunization. These statements treat one's personal susceptibility to communicable diseases, children's susceptibility to communicable diseases, the personal consequences of communicable diseases, the consequences of communicable diseases for children, the low cost of immunization, its high level of effectiveness for protection against disease, the relative safety of immunization, the importance of maintaining immunization records, and the importance of bringing those records to health care providers at appropriate times.

ADDITIONAL INFORMATION:

Test specifications for this measure can be found on pages 168-170.

IDEAS ABOUT IMMUNIZATION

This survey asks your opinions about immunization against communicable diseases such as measles, mumps, rubella, influenza, and polio.

Read each statement. Decide the extent to which you agree with it. Circle the appropriate letter to the left of the statement. Use the following scale:

SA = Strongly Agree
A = Agree
U = Uncertain
D = Disagree
SD = Strongly Disagree

SA A U D SD 1. There is little chance anymore that children will get communicable diseases.

SA A U D SD 2. Communicable diseases present serious health problems for children.

SA A U D SD 3. I should keep track of my own immunizations rather than relying on my doctor or clinic.

SA A U D SD 4. Communicable diseases aren't very dangerous for me personally.

SA A U D SD 5. Immunizations can protect people against communicable diseases.

SA A U D SD 6. It doesn't matter if children get communicable diseases because it's just part of growing up.

SA A U D SD 7. Immunizations aren't worth the cost.

SA A U D SD 8. There's a good chance that I will get a communicable disease.

SA A U D SD 9. If I had a communicable disease, it could be very serious.

READEX FICHE

SA A U D SD 10. It is the doctor's job to keep immunization records, not mine.

SA A U D SD 11. Children today are very likely to come down with one communicable disease or another.

SA A U D SD 12. It's not very likely that I will get a communicable disease.

SA A U D SD 13. The risk of being immunized is small compared to the benefits.

SA A U D SD 14. There's no reason to bring my immunization records when I go to a doctor or clinic because the records are on file there anyway.

SA A U D SD 15. For the good they do, immunizations really cost very little.

SA A U D SD 16. My family and I will get better health care if we bring our immunization records with us when we go to the doctor or clinic.

SA A U D SD 17. Adults don't need to have immunizations.

SA A U D SD 18. Immunizations are dangerous.

INSTRUCTIONS FOR SCORING

IDEAS ABOUT IMMUNIZATION

Point values are assigned to responses according to the following scoring key.

SCORING KEY

	SA	A	U	D	SD
1.	1	2	3	4	5
2.	5	4	3	2	1
3.	5	4	3	2	1
4.	1	2	3	4	5
5.	5	4	3	2	1
6.	1	2	3	4	5
7.	1	2	3	4	5
8.	5	4	3	2	1
9.	5	4	3	2	1
10.	1	2	3	4	5
11.	5	4	3	2	1
12.	1	2	3	4	5
13.	5	4	3	2	1
14.	1	2	3	4	5
15.	5	4	3	2	1
16.	5	4	3	2	1
17.	1	2	3	4	5
18.	1	2	3	4	5

This inventory can be scored by adding the point value of every response and dividing this sum by the number of responses. The maximum score attainable of 5 points indicates a high level of acceptance of the importance of immunization as it relates to personal and children's susceptibility to communicable diseases, personal consequence and consequences to children of contracting communicable diseases, the low cost and high level of effectiveness of immunization for protection against diseases, the relative safety of immunization, and the importance of maintaining and bringing records of immunization at appropriate times.

In addition to an overall score for this outcome, responses can be considered separately as follows:

Immunization Importance Areas	Items
Personal susceptibility to communicable diseases	8, 12
Children's susceptibility to communicable diseases	1, 11
Personal consequences of contracting communicable diseases	4, 9
Consequences to children of contracting communicable diseases	2, 6
Cost of immunization	7, 15
Effectiveness of immunization	5, 17
Safety of immunization	13, 18
Maintaining records of immunization	3, 10
Bringing records of immunization	14, 16

THINK ABOUT IMMUNIZATION

TYPE OF MEASURE: Affective

OUTCOME ASSESSED: Belief in the Importance of Immunization

TARGET POPULATION: Elementary school children

GENERAL DESCRIPTION:

This inventory is a Likert scale in which children are asked to register their degree of agreement with a series of statements about the importance of immunization. These statements treat a child's personal susceptibility to disease, the personal consequences of contracting a communicable disease, the effectiveness of immunization for protection against disease, the relative safety of immunization, and the importance of maintaining and bringing immunization records when receiving health care.

ADDITIONAL INFORMATION:

Test specifications for this measure can be found on pages 171-173.

THINK ABOUT IMMUNIZATION

The statements below are about immunization. Circle the word that show how much you agree with each statement.

YES = I agree
MAYBE = I am not sure if I agree
NO = I do not agree

YES MAYBE NO 1. Immunizations can protect me from diseases such as measles and polio.

YES MAYBE NO 2. Immunizations are dangerous.

YES MAYBE NO 3. If I had a disease such as measles or mumps, it wouldn't be so bad.

YES MAYBE NO 4. I should keep track of my own immunization record card.

YES MAYBE NO 5. I don't have much chance of catching a disease such as polio or mumps.

YES MAYBE NO 6. I don't need to bring my immunization record card to my doctor because my doctor has a record.

YES MAYBE NO 7. If I don't get immunizations, I could get sick with a disease such as rubella or mumps.

YES MAYBE NO 8. If I caught a disease such as polio or measles, I could get very sick.

YES MAYBE NO 9. I don't have to keep my immunization record card because my doctor keeps my records.

YES MAYBE NO 10. It is safer to get immunizations than not to get them.

YES MAYBE NO 11. It's silly for me to get immunizations because I still can catch diseases such as mumps or measles.

YES MAYBE NO 12. The doctor can help me more if I bring my immunization record card when I come for a check up.

INSTRUCTIONS FOR SCORING
THINK ABOUT IMMUNIZATION

Point values are assigned to responses according to the following scoring key.

SCORING KEY

	YES	MAYBE	NO
1.	2	1	0
2.	0	1	2
3.	0	1	2
4.	2	1	0
5.	0	1	2
6.	0	1	2
7.	2	1	0
8.	2	1	0
9.	0	1	2
10.	2	1	0
11.	0	1	2
12.	2	1	0

This inventory can be scored by adding the point values of every response and dividing this sum by the number of responses. The maximum score attainable of 2 points indicates a strong belief in the importance of immunization as it relates to personal susceptibility to communicable diseases, personal consequences of communicable disease, the effectiveness of immunization, the relative safety of immunization, and the importance of maintaining and bringing immunization records when receiving health care.

In addition to an overall score for this outcome, responses can be considered separately as follows:

Area	Items
Personal susceptibility to communicable diseases	5, 7
Personal consequences of contracting communicable diseases	3, 8
Effectiveness of immunization	1, 11
Safety of immunization	2, 10
Importance of maintaining records	4, 9
Importance of bringing records	6, 12

WOULD YOU OBTAIN IMMUNIZATION?

TYPE OF MEASURE: Affective

OUTCOME ASSESSED: Intention to Obtain Immunization

TARGET POPULATION: Adults or Adolescents

GENERAL DESCRIPTION:

This measure is designed to assess individuals' intention to obtain immunizations for communicable diseases. Individuals are presented with a series of situations which might serve as barriers to obtaining immunization and asked to indicate if they intend to obtain immunization in each situation. If they indicate that they would obtain immunization, they are asked to estimate, on a 10 to 100 numerical scale, how confident they are of their intention to obtain immunization in that situation.

ADDITIONAL INFORMATION:

Test specifications for this measure can be found on pages 174-176.

WOULD YOU OBTAIN IMMUNIZATION?

This survey is about immunization. Immunization means receiving a vaccine that increases the body's resistance to disease and decreases the chances of getting that disease. Among the diseases for which a person can be immunized are measles, mumps, tetanus, influenza, and polio.

The survey describes various situations. Read each statement. Circle YES or NO to show whether, *if appropriate*, you would obtain immunization in that situation. If you circle YES, then use the Confidence Scale to show how certain you are of your answer.

The following examples show how the Confidence Scale is used.

Physical Strength Examples	**CAN YOU DO THIS?**	**IF YES, HOW CERTAIN ARE YOU?**
You can lift a 50 pound weight.	**[✓ YES]/NO**	70
You can lift a 200 pound weight.	**YES/[✓ NO]**	____

Confidence Scale

10	**20**	**30**	**40**	**50**	**60**	**70**	**80**	**90**	**100**
Very Uncertain				**Somewhat Certain**					**Very Certain**

		WOULD YOU OBTAIN IMMUNIZATION?	IF YES, HOW CERTAIN ARE YOU?
1.	You are very busy.	YES/NO	_____
2.	You have just been to your doctor who said that you are very healthy.	YES/NO	_____
3.	You are scared that getting a shot will hurt.	YES/NO	_____

	WOULD YOU OBTAIN IMMUNIZATION?	IF YES, HOW CERTAIN ARE YOU?
4. You would have to go to a clinic in an unfamiliar place.	YES/NO	____
5. You didn't feel well after your last immunization.	YES/NO	____
6. Your friends aren't getting immunized and they aren't worried.	YES/NO	____
7. You have several large bills to pay.	YES/NO	____
8. You just moved to a new neighborhood and don't have a doctor yet.	YES/NO	____
9. Your doctor didn't tell you to be immunized.	YES/NO	____
10. You are afraid of needles.	YES/NO	____
11. You feel as though you can't really afford to pay a doctor's bill.	YES/NO	____
12. You rarely catch diseases that are going around.	YES/NO	____
13. You had a bad experience during your last visit to the doctor.	YES/NO	____
14. You have to ask someone else to drive you to the doctor.	YES/NO	____
15. You have to take time away from something else you need to do.	YES/NO	____
16. The clinic won't make appointments, so you will have to sit and wait.	YES/NO	____

INSTRUCTIONS FOR SCORING

WOULD YOU OBTAIN IMMUNIZATION?

This inventory can be scored in several ways, two of which are described below. The first procedure relies on the YES/NO responses only, providing an easily obtained gross index of intention to obtain immunization. The second procedure combines the YES/NO responses and the confidence ratings in a single score, providing an index that reflects intention to obtain immunization across a variety of settings, coupled with the level of confidence manifested in that intention.

ANALYSIS OF YES/NO RESPONSES ONLY

Count the number of YES responses, disregarding the confidence ratings. The maximum score attainable of 16 YES responses represents a strong intention to obtain immunization in a wide variety of situations.

ANALYSIS COMBINING YES/NO RESPONSES AND CONFIDENCE RATINGS

Total all of the confidence ratings made in conjunction with a "YES" response and divide this sum by 16 (the total number of items in the inventory.) The maximum score attainable of 100 represents a strong intention to obtain immunization across a wide variety of situations, along with a high level of confidence in that intention. It should be noted that this scoring procedure assumes a confidence rating of zero for those items to which respondents indicated "NO," meaning that they do not think they would obtain immunization in the situation described.

In addition to an overall score for this outcome, responses can be considered separately as follows:

Type of Barrier	Item
Limited resources	1, 7, 11, 15
Inconvenience	4, 8, 14, 16
Concern about physical or emotional discomfort	3, 5, 10, 13
Lack of perceived need for immunization	2, 6, 9, 12

IMMUNIZATION FOR CHILDREN

TYPE OF MEASURE: Affective

OUTCOME ASSESSED: Intention to Have Children Immunized

TARGET POPULATION: Parents or Guardians

GENERAL DESCRIPTION:

This measure is designed to assess parents' or guardians' intentions to obtain immunization for their children. Respondents are presented with a series of situations which might serve as barriers to obtaining immunization for children. They are asked to indicate if they intend to obtain immunization for their child in each situation. If they indicate that they intend to obtain immunization for their child, they are asked to estimate, on a 10 to 100 numerical scale, how confident they are of their intention to obtain immunization in that situation.

ADDITIONAL INFORMATION:

Test specifications for this measure can be found on pages 177-180.

IMMUNIZATION FOR CHILDREN

This survey is about immunization for children. Immunization means receiving a vaccine that increases the body's resistance to a disease and decreases the chances of getting that disease. Among the diseases for which children can be immunized are measles, mumps, tetanus, and polio.

The survey describes various situations. Read each statement. Circle YES or NO to show whether, if appropriate, you would have your child immunized. If you circle YES, then use the Confidence Scale to show how certain you are of your answer.

The following examples show how the Confidence Scale is used.

Physical Strength Examples	**CAN YOU DO THIS?**	**IF YES, HOW CERTAIN ARE YOU?**
You can lift a 50 pound weight.	[✓ YES]/NO	70
You can lift a 200 pound weight.	YES/[✓ NO]	______

Confidence Scale

10	20	30	40	50	60	70	80	90	100
Very Uncertain				Somewhat Certain					Very Certain

		WOULD YOU HAVE YOUR CHILD IMMUNIZED?	IF YES, HOW CERTAIN ARE YOU?
1.	You are very busy.	YES/NO	______
2.	The doctor has just examined your child and said your child was very healthy.	YES/NO	______
3.	You are scared that getting a shot might hurt your child.	YES/NO	______

		WOULD YOU HAVE YOUR CHILD IMMUNIZED?	IF YES, HOW CERTAIN ARE YOU?
4.	You would have to take your child to a clinic in an unfamiliar place.	YES/NO	____
5.	Your child didn't feel well after the last immunization.	YES/NO	____
6.	Your friends aren't getting their children immunized and they aren't worried.	YES/NO	____
7.	You have several large bills to pay.	YES/NO	____
8.	You have just moved to a new neighborhood and don't have a doctor for your child yet.	YES/NO	____
9.	Your child takes vitamins that are supposed to provide protection from disease.	YES/NO	____
10.	Your child is afraid of needles.	YES/NO	____
11.	You feel as though you can't really afford a doctor's bill.	YES/NO	____
12.	Your child doesn't get sick very often.	YES/NO	____
13.	Your child had a bad experience during the last visit to the doctor.	YES/NO	____
14.	You have to ask someone else to drive you and your child to the doctor.	YES/NO	____
15.	You have to take time away from something else you need to do.	YES/NO	____
16.	The clinic won't make appointments and you will have to sit and wait.	YES/NO	____

INSTRUCTIONS FOR SCORING
IMMUNIZATION FOR CHILDREN

This inventory can be scored in several ways, two of which are described below. The first procedure relies on the YES/NO responses only, providing an easily obtained gross index of intention to seek or accept immunization for children. The second procedure combines the YES/NO responses and the confidence ratings in a single score, providing an index that reflects perceived intention to seek or accept immunization for children across a variety of settings, coupled with the level of confidence manifested in that intention.

ANALYSIS OF YES/NO RESPONSES ONLY

Count the number of YES responses, disregarding the confidence ratings. The maximum score attainable of 16 YES responses represents a strong perceived intention to seek or accept immunization for children in a wide variety of situations.

ANALYSIS COMBINING YES/NO RESPONSES AND CONFIDENCE RATINGS

Total all of the confidence ratings made in conjunction with a "YES" response and divide this sum by 16 (the total number of items in the inventory.) The maximum score attainable of 100 represents a strong perceived intention to seek or accept immunization for children across a wide variety of situations, along with a high level of confidence in that intention. It should be noted that this scoring procedure assumes a confidence rating of zero for those items to which respondents indicated "NO," meaning that they do not think they would seek or accept immunization for a child in the situation described.

In addition to an overall score for this outcome, responses can be considered separately as follows:

Type of Barrier	Item
Limited resources	1, 7, 11, 15
Inconvenience	4, 8, 14, 16
Concern about physical or emotional discomfort	3, 5, 10, 13
Lack of perceived need for immunization	2, 6, 9, 12

KEEPING TRACK

TYPE OF MEASURE: Affective

OUTCOME ASSESSED: Intention to Maintain Immunization Records

TARGET POPULATION: Adults or Adolescents

GENERAL DESCRIPTION:

This measure is designed to assess individuals' intention to maintain immunization records for themselves and their children, if any. Individuals are presented with a series of situations which serve as barriers to maintaining immunization records. They are asked to indicate if they intend to maintain immunization records in each situation. If respondents indicate that they intend to maintain immunization records, they are asked to estimate, on a 10 to 100 numerical scale, how confident they are of their intention to maintain records in that situation.

ADDITIONAL INFORMATION:

Test specifications for this measure can be found on pages 181-183.

KEEPING TRACK

This survey is about maintaining immunization records for yourself and for your children, if you have any. Maintaining records requires that you keep your immunization record cards in a safe place where you can easily find them. These cards are the forms used by a doctor or nurse to record each immunization that is given.

The survey describes various situations. Read each statement. Circle YES or NO to show if you would maintain immunization records. If you circle YES, then use the Confidence Scale to show how certain you are of your answer.

The following examples show how the Confidence Scale is used.

Physical Strength Examples	CAN YOU DO THIS?	IF YES, HOW CERTAIN ARE YOU?
You can lift a 50 pound weight.	[✓ YES]/NO	70
You can lift a 200 pound weight.	YES/[✓ NO]	___

Confidence Scale

10	20	30	40	50	60	70	80	90	100
Very Uncertain				Somewhat Certain					Very Certain

		WOULD YOU MAINTAIN IMMUNIZATION RECORDS?	IF YES, HOW CERTAIN ARE YOU?
1.	You move rather frequently.	YES/NO	___
2.	You believe that schools maintain immunization records.	YES/NO	___

		WOULD YOU MAINTAIN IMMUNIZATION RECORDS?	IF YES, HOW CERTAIN ARE YOU?
3.	You have a hard time remembering where you put things.	YES/NO	___
4.	Your doctor did not tell you to keep immunization records.	YES/NO	___
5.	You are not sure when you need to have your immunization records.	YES/NO	___
6.	You travel frequently.	YES/NO	___
7.	Where you live is very crowded and things often get lost or thrown out.	YES/NO	___
8.	You have taken your family to the same doctor for years.	YES/NO	___
9.	The information on the record card is confusing to you.	YES/NO	___
10.	All required immunizations have already been given.	YES/NO	___

INSTRUCTIONS FOR SCORING

KEEPING TRACK

This inventory can be scored in several ways, two of which are described below. The first procedure relies on the YES/NO responses only, providing an easily obtained gross index of intention to maintain immunization records. The second procedure combines the YES/NO responses and the confidence ratings in a single score, providing an index that reflects intention to maintain immunization records across a variety of settings, coupled with the level of confidence manifested in that intention.

ANALYSIS OF YES/NO RESPONSES ONLY

Count the number of YES responses, disregarding the confidence ratings. The maximum score attainable of 10 YES responses represents a strong perceived intention to maintain immunization records in a wide variety of settings.

ANALYSIS COMBINING YES/NO RESPONSES AND CONFIDENCE RATINGS

Total all of the confidence ratings made in conjunction with a "YES" response and divide this sum by 8 (the total number of items in the inventory.) Confidence ratings made in conjunction with a "NO" response should be omitted from the analysis. The maximum score attainable of 100 represents a strong perceived intention to maintain immunization records across a wide variety of situations, along with a high level of confidence in that intention. It should be noted that this scoring procedure assumes a confidence rating of zero for those items to which respondents indicated "NO," meaning that they do not think they would maintain immunization records in the situation described.

In addition to an overall score for this outcome, responses can be considered separately as follows:

Type of Barrier	Item
Change in location	1, 6
Lack of perceived responsibility for maintaining the record	2, 8
General disorganization	3, 7
Confusion about the record	5, 9
Lack of perceived importance of the record	4, 10

BRINGING RECORDS FOR YOUR CHILD

TYPE OF MEASURE:	Affective
OUTCOME ASSESSED:	Intention to Bring Immunization Record Cards for Children
TARGET POPULATION:	Parents or Guardians

GENERAL DESCRIPTION:

This measure is designed to assess parents' or guardians' intentions to bring immunization records whenever they bring their children for health care. Individuals are presented with a series of situations which might serve as barriers to bringing immunization records and are asked to indicate if they would bring immunization records in each situation. If they indicate that they would bring their child's immunization record, then they are asked to estimate, on a 10 to 100 numerical scale, how confident they are that they would bring records in that situation.

ADDITIONAL INFORMATION:

Test specifications for this measure can be found on pages 184-186.

BRINGING RECORDS FOR YOUR CHILD

This survey is about bringing your child's immunization record card with you whenever your child gets health care. An immunization record card is the form used by a doctor or nurse to record each immunization that is given.

This survey describes various situations. Read each statement. Circle YES or NO to show if you would bring your child's immunization record. If you circle YES, then use the Confidence Scale to show how certain you are of your answer.

The following examples show how the Confidence Scale is used.

Physical Strength Examples	CAN YOU DO THIS?	IF YES, HOW CERTAIN ARE YOU?
You can lift a 50 pound weight.	[✓ YES]/NO	70
You can lift a 200 pound weight.	YES/[✓ NO]	____

Confidence Scale

10	20	30	40	50	60	70	80	90	100
Very Uncertain				Somewhat Certain					Very Certain

		WOULD YOU BRING YOUR CHILD'S IMMUNIZATION RECORD?	IF YES, HOW CERTAIN ARE YOU?
1.	You are running late for your child's appointment.	YES/NO	____
2.	You have just moved and aren't sure where all your important papers are.	YES/NO	____

		WOULD YOU BRING YOUR CHILD'S IMMUNIZATION RECORD?	IF YES, HOW CERTAIN ARE YOU?
3.	Your child's last immunization was given by the same person who you will see this time.	YES/NO	___
4.	Your doctor didn't tell you to bring the immunization record with you.	YES/NO	___
5.	You don't remember exactly where you put the immunization record.	YES/NO	___
6.	You are rushed because you have several errands to finish before going to the doctor.	YES/NO	___
7.	You have been going to the same doctor for years.	YES/NO	___
8.	Your child hasn't been immunized for a long time.	YES/NO	___

INSTRUCTIONS FOR SCORING
BRINGING RECORDS FOR YOUR CHILD

This inventory can be scored in several ways, two of which are described below. The first procedure relies on the YES/NO responses only, providing an easily obtained gross index of the intention to bring children's immunization records. The second procedure combines the YES/NO responses and the confidence ratings in a single score, providing an index that reflects the intention to bring children's immunization records across a variety of settings, coupled with the level of confidence manifested in that intention.

ANALYSIS OF YES/NO RESPONSES ONLY

Count the number of YES responses, disregarding the confidence ratings. The maximum score attainable of 8 YES responses represents a strong perceived intention to bring a child's immunization records in a wide variety of situations.

ANALYSIS COMBINING YES/NO RESPONSES AND CONFIDENCE RATINGS

Total all of the confidence ratings made in conjunction with a "YES" response and divide this sum by 8 (the total number of items in the inventory.) Confidence ratings made in conjunction with a "NO" response should be omitted from the analysis. The maximum score attainable of 100 represents a strong perceived intention to bring a child's immunization records across a wide variety of settings, along with a high level of confidence in that intention. It should be noted that this scoring procedure assumes a confidence rating of zero for those items to which respondents indicated "NO," meaning that they do not think they would bring their child's immunization records in the situation described.

In addition to an overall score for this outcome, responses can be considered separately as follows:

Potential Barrier	Item
Lack of perceived need for immunization records	4, 8
Lack of perceived responsibility for record keeping	3, 7
Difficulty in locating immunization records	2, 5
Being rushed before going to the doctor	1, 6

MY BODY

TYPE OF MEASURE: Affective

OUTCOME ASSESSED: Respect for One's Body

TARGET POPULATION: Elementary school children

GENERAL DESCRIPTION:

This measure is designed to assess children's respect for their bodies. Children are asked to indicate whether they would engage in activities which are healthful and avoid activities which are harmful to the body.

ADDITIONAL INFORMATION:

Test specifications for this measure can be found on pages 187-188.

MY BODY

Read each question. Then put a check (√) under the answer that best tells what you are willing to do to take care of your body.

In order to take care of your body, are you willing to ...	CERTAINLY YES	PROBABLY YES	MAYBE	PROBABLY NOT	CERTAINL NOT
1. ... exercise several times each week?	___	___	___	___	___
2. ... never drink large amounts of alcohol?	___	___	___	___	___
3. ... do what your doctor tells you to do?	___	___	___	___	___
4. ... never smoke any cigarettes?	___	___	___	___	___
5. ... get immunizations against diseases?	___	___	___	___	___
6. ... get at least 8 hours of sleep every night?	___	___	___	___	___
7. ... see your doctor regularly?	___	___	___	___	___
8. ... not let yourself get too anxious?	___	___	___	___	___
9. ... be careful about what you eat?	___	___	___	___	___
10. ... never take drugs that are not necessary?	___	___	___	___	___

INSTRUCTIONS FOR SCORING

MY BODY

Point values are assigned to responses according to the following scoring key:

SCORING KEY

CERTAINLY YES = 5
PROBABLY YES = 4
MAYBE = 3
PROBABLY NOT = 2
CERTAINLY NOT = 1

This inventory can be scored by adding the point value of every response and dividing this sum by the number of responses. The maximum score attainable of 5 points indicates a strong respect for one's body, as evidenced by a willingness to engage in activities which are good for it and to avoid those which are not.

CHAPTER SIX

OTHER MEASURES

This chapter contains the previously developed measures that were located as a result of a comprehensive literature search and then identified as corresponding to the outcome statements listed in Chapter Four. The process by which existing measures were screened and selected is explained more completely in Chapter Two.

A descriptor page precedes each measure. This page indicates the type of measure (behavioral, knowledge, skill, or affective), the title of the outcome assessed, and the target population for the instrument. A general description is presented, providing an overview of the assessment strategy employed in the measure. The general description also provides information about the manner in which the instrument has previously been used. A technical information section summarizes any psychometric information that has been collected for the instrument. The measure's author(s) are listed. If there is any additional information available about a measure, reference citations are also given.

All of the measures in this chapter have been readied for possible photocopying. Directions to respondents and scoring instructions have been provided whenever they were available.

IMMUNIZATION RECORD

TYPE OF MEASURE: Behavioral

OUTCOME ASSESSED: Maintenance of Appropriate Immune Status

TARGET POPULATION: Parents or Guardians

GENERAL DESCRIPTION:

The Immunization Record is a form designed to help parents or guardians maintain up-to-date records of children's immunizations. The form includes spaces for the names and birthdates of three children. Whenever DPT or polio immunizations are administered, the dates are to be recorded in the corresponding sections. Immunization dates for measles, rubella, and mumps are also to be noted. The form serves as evidence of immunizations and may function as a reminder of upcoming visits to the doctor for immunizations.

AUTHOR: U.S. Department of Health, Education, and Welfare
Centers for Disease Control

ADDITIONAL INFORMATION:

U.S. Department of Health, Education, and Welfare. Parents' guide to childhood immunization. Washington, D.C.: U.S. Government Printing Office, 1977. (DHEW Pub. No. (05) 77-50058)

IMMUNIZATION RECORD

NAMES				
BIRTH DATES				
DPT	**First**			
	Second			
	Third			
	Fourth			
	Boosters			
POLIO	**First**			
	Second			
	Third			
	Booster			
	Booster			
MEASLES **RUBELLA** **MUMPS**				

CALIFORNIA IMMUNIZATION RECORD CARD

TYPE OF MEASURE: Behavioral

OUTCOME ASSESSED: Maintenance of Appropriate Immune Status

TARGET POPULATION: Parents or Guardians

GENERAL DESCRIPTION:

The California Immunization Record Card is designed to help parents or guardians maintain current records of children's immunizations. A separate record card is to be maintained for each child. The front of the card provides spaces to record the child's name, birthdate, allergies, and vaccine reactions. The dates of DPT, polio, measles, rubella, and mumps vaccines are noted, as well as the doctor or clinic who provided the vaccines, relevant medical notes, and the date the next vaccine is due. The card is folded and encased in plastic for permanent protection. Many states have a similar immunization card available from the State Department of Public Health.

AUTHOR: California State Department of Health Services

ADDITIONAL INFORMATION:

National League of Nursing. Guidelines for volunteer participation in childhood immunization programs. New York: Author, 1980. (Pub. No. 52-1800)

VACCINE	DATE GIVEN	DOCTOR OFFICE OR CLINIC

TB SKIN TESTS *Pruebas de la Tuberculosis*	Date ______ ☐ Pos ☐ Neg Indur. ______ mm	Date ______ ☐ Pos ☐ Neg Indur. ______ mm	Date ______ ☐ Pos ☐ Neg Indur. ______ mm

IMPORTANT – ***IMPORTANTE***

Your child must meet California's immunization requirements to be enrolled in school. Keep this Record as proof of immunization.

Su niño debe cumplir con los requisitos de vacunas del Estado de California para ser admitido a la escuela. Mantega este Comprobante: lo necesitará.

- -

IMMUNIZATION RECORD

Comprobante de Inmunizacion

STATE OF CALIFORNIA EUREKA DEPARTMENT OF HEALTH

Name *nombre* ______________________

Birthdate *fecha de nacimiento* ______________________

Allergies *alergias* ______________________

Vaccine Reactions *reacciones a la vacuna* ______________________

RETAIN THIS DOCUMENT – ***CONSERVE ESTE DOCUMENTO***

Name **Sex** **Birthdate**

VACCINE *vacuna*		**DATE GIVEN** *fecha de vacunación*	**DOCTOR OFFICE OR CLINIC** *médico o clínica*	**DATE NEXT DOSE DUE** *próxima vacuna*
POLIO	1			
	2			
	3			
	4			
DTP/Td Diphtheria, Tetanus, Pertussis (Whooping Cough) *difteria, tétano y tos ferina*	1			
	2			
	3			
	4			
	5			
MEASLES *sarampión*				
RUBELLA *sarampión alemán*				
MUMPS *paperas*				

CALIFORNIA IMMUNIZATION BABY TRACK

TYPE OF MEASURE: Behavioral

OUTCOME ASSESSED: Immunization of Unprotected Populations

TARGET POPULATION: Immunization providers

GENERAL DESCRIPTION:

The California Immunization Baby Track is designed to help immunization providers locate, vaccinate, and maintain immunization records for newborns. The tracking forms are filed at the hospitals when babies are born. Three months and seven months follow-up calls are made to check on immunization status. Several states utilize similar baby track systems. The American Red Cross in Greater New York has also developed a baby track system to aid providers in monitoring current immunization status.

AUTHOR: California State Department of Health Services

ADDITIONAL INFORMATION:

National League of Nursing. Guidelines for volunteer participation in childhood immunization programs. New York: Author, 1980. (Pub. No. 52-1800)

CALIFORNIA IMMUNIZATION BABY TRACK

(USE PEN, PRESS HARD)

FOLLOW-UP CALLS	3 months / /	7 months / /

Hospital ____________________

Baby's First Name ____________________ Birth-date ____________________ Baby's Sex M F Baby's Doctor ____________________

Mother's Name ____________________ City ____________________ Phone ____________________ *Circle one:* White Spanish Black Asian O

Volunteer Visit Name ____________________ Date of visit ____________________

☐ Mother Refused ____________ ____________ Mother's Language (if no English) ____________________

☐ 3 MONTHS CALL ____________ *date*

BABY HAS RECEIVED
- ☐ 1st polio } up-to-date
- ☐ 1st DTP } up-to-date
- ☐ No Immunizations

DOCTOR/NURSE/CLINIC GAVE MOTHER
- ☐ Yellow Calif. Immunization Record
- ☐ Other Immunization Record
- ☐ No Immunization Record

SOURCE OF IMMUNIZATION
- ☐ Private Pediatrician
- ☐ Health Department
- ☐ Prepaid Health Plan
- ☐ Other Doctor or Clinic

☐ 7 MONTHS CALL ____________ *date*

BABY HAS RECEIVED
- ☐ 1st, 2nd polio } up-to-date
- ☐ 1st, 2nd, 3rd DTP } up-to-date ☐ *3rd polio, optional*
- ☐ Only 1st polio
- ☐ Only 1st, 2nd DTP
- ☐ Only 1st DTP
- ☐ No Immunizations

IMMUNIZATION RECORD
- ☐ All checked above are shown on record.
- ☐ Only some of the above are on it.
- ☐ No record ever given to her.
- ☐ Record lost or misplaced.

NOTES ON FOLLOW-UP

OPTIONAL CAR SEAT INFORMATIO

AT THREE MONTHS:
- ☐ Uses always ☐ Uses most of
- ☐ Uses sometimes ☐ No car seat
- ☐ ____________

AT SEVEN MONTHS:
- ☐ Uses always ☐ Uses most of
- ☐ Uses sometimes ☐ No car seat
- ☐ ____________

Tracking Problem—Drop From Program

☐ No answer ☐ Phone Disconnected ☐ Other ____________________

CHAPTER SEVEN

TEST SPECIFICATIONS

This chapter contains the test specifications for all the newly-developed measures presented in Chapter Five. The specifications are arranged in the same order as that chapter's measures, with the behavioral measure first, followed by knowledge, skill, and affective instruments.

Test specifications describe in detail both what an instrument is to measure and the manner in which the assessment is to be accomplished. Each set of test specifications begins with a General Description, which presents a brief overview of the scope and nature of the measure to be specified. A Sample Item follows, showing a typical item contained in the measure and the directions to respondents that accompany the instrument. The Stimulus Attributes section lists the rules that explain how the items for the measure are to be constructed. The Response Attributes section lists the rules that explain how the response options for the measure are to be constructed.

Many of the sets of specifications have one or more additional sections. A Technical Terms Supplement lists content-specific words which exceed the normal readability restrictions of a measure but which are used because of their importance and relevance. A Specifications Supplement, contained in all knowledge test specifications, presents an exhaustive listing of the content eligible for testing. Knowledge test specifications also contain a Bibliography which cites the references consulted in developing the content listing. Behavioral and affective test specifications include a Scoring and Interpretation section which explains the rationale and procedures to be used in evaluating the measure's data. Some affective test specifications also include a section entitled Measure Format which presents an item-by-item overview of the measure itself, highlighting the different variables represented by each item.

pages tightly bound

TEST SPECIFICATIONS
IMMUNIZATION SURVEY

GENERAL DESCRIPTION

Individuals are asked about the immunization status of any children under their charge. This information can be used as a measure of how effective an immunization program is in ensuring that children are immunized against polio, diphtheria, tetanus, pertussis, measles, mumps, and rubella.

SAMPLE ITEM

This surveys asks about the immunization history of your child. If you have a written record of your child's immunizations, available on an immunization record card or from your doctor or clinic, please use that record in completing the survey.

Vaccine	Date Vaccine Administered					Never Administered
	Dose 1	Dose 2	Dose 3	Dose 4	Dose 5	
DTP						

STIMULUS ATTRIBUTES

1. An item will ask about the following characteristics related to a child's immunization status.
    a. The child's date of birth.
    b. Whether the child has an exemption from immunization requirements.
    c. The administration date of each dose of polio, DTP, measles, mumps, and rubella vaccine.
    d. The source of the immunization information for the child's immunization status.
2. Individuals who indicate that their child has an exemption from immunization requirements will be asked to indicate the type of exemption.

RESPONSE ATTRIBUTES

1. All items will be either forced-choice or open-ended.

2. Forced-choice items will require the individual to indicate whether the child has an immunization exemption and the source of the immunization record used to complete the survey.

3. Open-ended questions will be used to elicit dates relevant to the immunization status of the individual's child and, if applicable, to indicate the type of immunization exemption the child has.

INTERPRETATION

1. The responses to the questionnaire should permit immunization providers to assess the current immunization status of the child in question.

2. If no immunizations were administered, but the child has either a medical or an acceptable personal belief exemption, the child is not required to meet immunization guidelines.

3. If no immunizations were administered, the child is over 2 months old, and there is no medical or acceptable personal belief exemption, the child should be considered to be inadequately immunized.

4. If written immunization records are available from an identifiable source, the immunization status reported in the questionnaire should be checked for completeness based on the attached immunization schedule.

5. The "Recommended Immunization Schedule for Infants" identifies the number of doses and the usual sequencing for polio, DTP, measles, mumps, and rubella vaccines. Dates filled in by the respondent should be checked against the sequencing in this schedule.

6. If desired, program personnel can change the target vaccines by adding additional vaccines to the survey, or by eliminating ones that are listed, in order to focus data collection efforts on alternative vaccines. Such changes can be made without altering the basic content or format of the instrument.

7. If desired, program personnel can change the subject of the survey from "your child" to another subject of interest (e.g., "yourself"), without altering the basic content or format of the instrument.

RECOMMENDED IMMUNIZATION SCHEDULE FOR HEALTHY INFANTS AND CHILDREN[1]

TYPE OF VACCINE	EARLIEST AND MOST APPROPRIATE AGE FOR A VACCINE DOSE						TOTAL NUMBER OF DOSE FOR A COMPLETE SERIES
	2 mo.	4 mo.	6 mo.	15 mo.	18 mo.	4-6 yr.	
Polio[2] (OPV/IPV)	1st dose	2nd dose			3rd dose	4th dose	4 doses
DTP[3]	1st dose	2nd dose	3rd dose		4th dose	5th dose	5 doses
Measles[4]				1 dose			1 dose
Mumps[4]				1 dose			1 dose
Rubella[4]				1 dose			1 dose

---

[1] Report of the Committee on Infectious Disease 1982, American Academy of Pediatrics

[2] If IPV is administered, a third dose is given 4 to 8 weeks after the second dose. The fourth and fifth dose are given as indicated.

[3] For children who began after early infancy but before age 7, only four DTP shots may be necessary and sequencing may be variable.

[4] May be given as one shot using combined MMR vaccine.

TEST SPECIFICATIONS

COMMUNICABLE DISEASES

GENERAL DESCRIPTION

Individuals are presented with statements about the following communicable diseases: diphtheria, tetanus, pertussis (whooping cough), measles, mumps, rubella, and polio. Individuals indicate whether each statement is true or false.

SAMPLE ITEM

This test consists of 20 statements about communicable diseases. Some of the statements are true and some are false. If you think a statement is true, put a check in the column labeled TRUE. If you think a statement is false, put a check in the column labeled FALSE.

TRUE	FALSE	
____	____	1. Tetanus affects the nervous system.

STIMULUS ATTRIBUTES

1. A test item will consist of a single-sentence statement that the individual is to judge as true or false. This statement will contain information related to communicable diseases. Information about communicable diseases includes their characteristics, incidence, and effects.

2. All test items will be derived from the specifications supplement Communicable Diseases. This supplement presents statements about communicable diseases which are based upon either empirical evidence or expert consensus. These statements are organized into sections, with each section containing information about one communicable disease.

3. Each statement on the supplement consists of one main idea related to communicable diseases. A statement either (a) describes the nature or effects of a particular subject, (b) compares two subjects with respect to a particular attribute, or (c) presents a correlational or causal relationship between two subjects.

4. A test item will be based on a single statement selected from the supplement. If the supplement statement contains multiple parallel elements, only one of the elements will be used in the test item.

   Example of a supplement statement with multiple parallel elements

   Diphtheria can cause difficulty in breathing, sore throat, high fever (103-105°F), and weakness.

5. A test item will present a supplement statement in either accurate or inaccurate form. An accurate test item can be created in one of the following two ways:

   a. Direct restatement: Reiterating a statement exactly as it appears on the supplement.

   b. Paraphrase: Rephrasing a supplement statement to communicate the same message in different words. This rephrasing may include substituting synonyms for words in the statement and/or reordering words within the statement. The quantitative portion of a supplement statement may not be paraphrased.

      Example of a test item created by paraphrase

      Supplement statement: Tetanus causes death in approximately one-third of all cases.

      Test Item: Approximately one-third of all tetanus cases lead to death.

6. An inaccurate test item will be based on a supplement statement or a paraphrase of that statement. An inaccurate item can be created in one of the following three ways:

   a. Negation: Rewording a supplement statement to have the opposite meaning. If the statement is worded positively, negation is accomplished by adding a negative word or phrase to the statement. If the statement is worded negatively, negation is accomplished by taking out a negative word or phrase.

      Example of a test item created by negation

      Supplement statement: Tetanus affects the nervous system.

Test item: Tetanus does not affect the nervous system.

b. Mutual exclusivity: Transforming a supplement statement to communicate a message that is mutually exclusive with the original message. This transformation can be accomplished by either (1) changing a single verb, adjective, or adverb in the original statement to a word or phrase with a contradictory meaning, (2) changing a comparative statement to either reverse the direction of the comparison made or make both terms being compared equal, or (3) changing a quantitative value to one that is different than the one given. A quantitative change must result in a new value that makes the original statement false, rather than a value that allows the statement to remain true because it represents a subset of the original statement. A quantitative change must be expressed in the same terms as the original value.

Examples of test items created by transformation to a mutually exclusive statement

Supplement statement: Mumps is most common in school-age children.

Test item: Mumps is least common in school-age children.

Supplement statement: Diphtheria causes death in 10% of all cases.

Test item: Diphtheria causes death in 25% of all cases.

c. Substitution. Using descriptions of the origin, characteristics, or symptoms of one disease for a disease other than the one to which they correspond. Substitutions can be made for the following diseases: diphtheria, tetanus, pertussis (whooping cough), polio, measles, mumps, and rubella.

Example of a test item created by substitution

Supplement statement: Pertussis (whooping cough) is a communicable bacterial infection.

Test item: Pertussis (whooping cough) is a communicable viral infection. (appropriate for measles)

7. A test item will contain a maximum of 25 words. These words will be no higher than an eighth grade reading level on the IOX Basic Skills Word List. Technical terms not found on the word list may be used only if they are listed on the Technical Terms Supplement.

8. A test will contain an approximately equivalent number of accurate and inaccurate test items. These items will be selected according to the following procedures:

   a. One item will be randomly selected from each section of the supplement.

   b. The rest of the items will be randomly selected from the supplement as a whole.

   c. All of the items will be reviewed by content experts and modified as needed based upon this review.

9. All of the procedures for creating accurate and inaccurate test items will be used as equally as possible, with the exception of negation of a positively-stated supplement statement. This type of change will be used only when no other transformation is possible, as it results in a test item which requires the respondent to recognize that a negatively-stated idea is not accurate, in effect creating a double negative.

RESPONSE ATTRIBUTES

1. Two response columns will be provided. One column will be labeled "TRUE" and the other will be labeled "FALSE."

2. The correct answer to a question will be "TRUE" if the statement is accurate, or "FALSE" if the statement is inaccurate.

SPECIFICATIONS SUPPLEMENT
COMMUNICABLE DISEASES

Diphtheria

1. Diphtheria is a bacterial infection.

2. Diphtheria can affect the heart and the nervous system.

3. Diphtheria can cause difficulty in breathing, sore throat, high fever (103-105°F), and weakness.

4. Diphtheria causes death in 10% of all cases.

Tetanus

5. Tetanus is caused by a bacteria which may enter the body through a break in the skin.

6. Any size wound in any part of the body may be the beginning of a tetanus infection.

7. Tetanus affects the nervous system.

8. Tetanus can lead to lockjaw, convulsions, spasms in the back muscles, and a rigid neck.

9. Tetanus causes death in approximately one-third of all cases.

Pertussis (Whooping Cough)

10. Pertussis (whooping cough) is a communicable bacterial infection.

11. Pertussis (whooping cough) is characterized by severe coughing and gasping for breath.

12. Pertussis (whooping cough) can lead to ear infections, pneumonia, convulsions, and occasionally brain disorders.

Measles

13. Measles is a communicable viral infection.

14. Measles can lead to pneumonia and ear infections.

15. Measles is characterized by a high fever (103-105°F) and a rash.

16. Measles usually lasts for 10 days.

17. Measles is one of the most serious of the common childhood diseases.

18. Measles during pregnancy may lead to premature birth.

19. Approximately 1 out of every 2000-3000 children who develops measles may also become deaf or blind, have convulsions, brain disorders, or die.

Mumps

20. Mumps is a communicable viral infection.

21. Mumps may affect the salivary glands, ovaries, testes, pancreas, and/or central nervous system.

22. Mumps can lead to fever, headache, vomiting, and tenderness and swelling of the salivary glands.

23. Mumps is most common in school-age children.

24. Adults who have not had mumps or the mumps vaccine and who are near someone with mumps should see a doctor immediately.

Rubella (German Measles)

25. Rubella is a communicable viral disease.

26. Rubella can lead to a skin eruption, mild fever, and swollen glands.

27. A woman who develops rubella early in pregnancy may give birth to an infant with problems in vision, hearing, the heart, as well as mental retardation.

28. Rubella is most dangerous to pregnant women in their first four months of pregnancy.

29. A pregnant woman who develops rubella has a greater chance of aborting her child.

Polio

30. Polio is a communicable viral infection which affects the nervous system.

31. Polio can lead to paralysis of the arms, legs, or the muscles used for breathing.

32. Polio causes death in 5% of all cases.

TECHNICAL TERMS SUPPLEMENT

COMMUNICABLE DISEASES

central nervous system
communicable
convulsion
diphtheria
lockjaw
measles
mental retardation
mumps
ovaries
pancreas
pertussis (whooping cough)
pneumonia
polio
rubella
salivary gland
specific
testes
tetanus

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TEST SPECIFICATIONS
NATURE OF COMMUNICABLE DISEASES

GENERAL DESCRIPTION

Immunization providers are presented with statements about the following communicable diseases: diphtheria, tetanus, pertussis, measles, mumps, rubella, and polio. Immunization providers indicate whether each statement is true or false.

SAMPLE ITEM

> **This test consists of 20 statements about communicable diseases. Some of the statements are true and some are false. If you think a statement is true, put a check in the column labeled TRUE. If you think a statement is false, put a check in the column labeled FALSE.**

TRUE	FALSE		
____	____	1.	Tetanus may develop when the tetanus bacteria infects a wound.

STIMULUS ATTRIBUTES

1. A test item will consist of a single-sentence statement that the individual is to judge as true or false. This statement will contain information related to communicable diseases. Information about communicable diseases includes their characteristics, incidence, and effects.

2. All test items will be derived from the specifications supplement Nature of Communicable Diseases. This supplement presents statements about communicable diseases which are based upon either empirical evidence or expert consensus. The statements are organized into sections, with each section containing information about one disease.

3. Each statement on the supplement consists of one main idea related to communicable diseases or immunization. A statement either (a) describes the nature or effects of a particular subject, (b) compares two subjects with respect to a particular attribute, or (c) presents a correlational or causal relationship between two subjects.

4. A test item will be based on a single statement selected from the supplement. If the supplement statement contains multiple parallel elements, only one of the elements will be used in the test item.

   Example of a supplement statement with multiple parallel elements

   Symptoms of diphtheria include difficulty in breathing, sore throat, high fever (103-105°F), and weakness.

5. A test item will present a supplement statement in either accurate or inaccurate form. An accurate test item can be created in one of the following two ways:

   a. Direct restatement: Reiterating a statement exactly as it appears on the supplement.

   b. Paraphrase: Rephrasing a supplement statement to communicate the same message in different words. This rephrasing may include substituting synonyms for words in the statement and/or reordering words within the statement. The quantitative portion of a supplement statement may not be paraphrased.

      Example of a test item created by paraphrase

      Supplement statement: Tetanus primarily affects the nervous system.

      Test Item: The primary effect of tetanus is on the nervous system.

6. An inaccurate test item will be based on a supplement statement or a paraphrase of that statement. An inaccurate item can be created in one of the following three ways:

   a. Negation: Rewording a supplement statement to have the opposite meaning. If the statement is worded positively, negation is accomplished by adding a negative word or phrase to the statement. If the statement is worded negatively, negation is accomplished by taking out a negative word or phrase.

      Example of a test item created by negation

      Supplement statement: Rubella during early pregnancy may cause fetal abnormalities.

      Test item: Rubella during early pregnancy never causes fetal abnormalities.

b. Mutual exclusivity: Transforming a supplement statement to communicate a message that is mutually exclusive with the original message. This transformation can be accomplished by either (1) changing a single verb, adjective, or adverb in the original statement to a word or phrase with a contradictory meaning, (2) changing a comparative statement to either reverse the direction of the comparison made or make both terms being compared equal, or (3) changing a quantitative value to one that is different than the one given. A quantitative change must result in a new value that makes the original statement false, rather than a value that allows the statement to remain true because it represents a subset of the original statement. A quantitative change must be expressed in the same terms as the original value.

Examples of test items created by transformation to a mutually exclusive statement

Supplement statement: The majority of reported cases of mumps occur in children.

Test item: The majority of reported cases of mumps occur in adults.

Supplement statement: Diphtheria causes death in 10% of all cases.

Test item: Diphtheria causes death in 25% of all cases.

c. Substitution. Using a description of the origin, characteristics, or symptoms of one disease for a disease other than the one to which it corresponds. Substitutions can be made for the following diseases: diphtheria, tetanus, pertussis, polio, measles, mumps, and rubella.

Example of a test item created by substitution

Supplement statement: Pertussis is characterized by severe explosive coughing.

Test item: Tetanus is characterized by severe explosive coughing.

7. A test item will contain a maximum of 25 words.

8. A test will contain an approximately equivalent number of accurate and inaccurate test items. These items will be selected according to the following procedures:

   a. One item will be randomly selected from each section of the supplement.

   b. The rest of the items will be randomly selected from the supplement as a whole.

   c. All of the items will be reviewed by content experts and modified as needed based upon this review.

9. All of the procedures for creating accurate and inaccurate test items will be used as equally as possible, with the exception of negation of a positively-stated supplement statement. This type of change will be used only when no other transformation is possible, as it results in a test item which requires the respondent to recognize that a negatively-stated idea is not accurate, in effect creating a double negative.

RESPONSE ATTRIBUTES

1. Two response columns will be provided. One column will be labeled "TRUE" and the other will be labeled "FALSE."

2. The correct answer to a question will be "TRUE" if the statement is accurate, or "FALSE" if the statement is inaccurate.

SPECIFICATIONS SUPPLEMENT

NATURE OF COMMUNICABLE DISEASES

Diphtheria

1. Diphtheria is a communicable bacterial infection.

2. Symptoms of diphtheria include difficulty in breathing, sore throat, high fever (103-105°F), and weakness.

3. The most serious effects of diphtheria are to the heart, to the muscles, and to the nervous system.

4. Diphtheria causes death in 10% of all cases.

Tetanus

5. Tetanus may develop when the tetanus bacteria infects a wound.

6. A wound of any size in any part of the body should be considered a potential tetanus infection.

7. Tetanus primarily affects the nervous system.

8. Tetanus may produce difficulty in opening the jaw, convulsions, spasms in the back muscles, difficulty in breathing, a rigid neck, and exhaustion.

9. Tetanus causes death in approximately one-third of all cases.

Pertussis (Whooping Cough)

10. Pertussis is a communicable bacterial disease.

11. Pertussis causes inflammation of the respiratory passages and excessive production of mucus.

12. Pertussis is characterized by severe explosive coughing and gasping for breath, accompanied by a whooping sound.

13. As a result of pertussis, a patient may develop an ear infection, ruptured lungs, cranial hemorrhaging, and permanent enlargement of the bronchial tubes.

Measles

14. Measles (rubeola) is a communicable viral infection.

15. Measles usually lasts for 10 days and is characterized by respiratory symptoms of a sore throat and cough, a high fever (103-105°F), and a rash.

16. Measles is frequently complicated by a middle ear infection or bronchopneumonia.

17. Approximately 1 out of every 1000 cases of measles develops into encephalitis.

18. Death, primarily from respiratory and neurologic causes, occurs in approximately 1 out of every 1000 reported measles cases in the United States.

19. The risk of death or complications from measles is lower for children and adolescents than for infants and adults.

20. Measles during pregnancy increases fetal risk because of the increased chances of premature labor, spontaneous abortion, and low birth weight.

Mumps

21. Mumps is a generalized viral infection.

22. Mumps may affect the salivary glands, testes, pancreas, and/or central nervous system.

23. Mumps is characterized by fever, headache, vomiting, and inflammation of the salivary glands.

24. The majority of reported cases of mumps occur in children.

25. Benign meningeal complications occur in approximately 15% of the cases of mumps.

26. Orchitis (usually unilateral) has been reported as a complication in up to 20% of mumps cases reported in post-pubertal males.

Rubella

27. Rubella is a communicable viral disease.

28. Symptoms of rubella include rash, post-auricular and sub-occipital lymphadenopathy, arthralgia, and low fever.

29. Rubella during early pregnancy may cause severe fetal abnormalities.

Polio

30. Polio is a viral infection.

31. Attack of the nervous system by the polio virus may result in permanent paralysis.

32. Polio causes death in 5% of all cases.

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NATURE OF COMMUNICABLE DISEASES

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TEST SPECIFICATIONS
IMMUNIZATION INFORMATION

GENERAL DESCRIPTION

Individuals are presented with statements about immunization for communicable diseases. Individuals indicate whether each statement is true or false.

SAMPLE ITEM

> **This test consists of 20 statements about immunization. Some of the statements are true and some are false. If you think a statement is true, put a check in the column labeled TRUE. If you think a statement is false, put a check in the column labeled FALSE.**

TRUE	FALSE	
____	____	1. Single vaccines protect an individual from one disease.

STIMULUS ATTRIBUTES

1. A test item will consist of a single-sentence statement that the individual is to judge as true or false. This statement will contain information related to immunization. Immunization information includes who should be immunized, when immunization should occur, the effects of immunization, and what conditions affect the success of an immunization.

2. All test items will be derived from the specifications supplement Immunization Information. This supplement presents statements about immunization which are based upon either empirical evidence or expert consensus. The statements are oranized into sections, with each section containing information about one aspect of immunization.

3. Each statement on the supplement consists of one main idea related to immunization. A statement either (a) describes the nature or effects of a particular subject, (b) compares two subjects with respect to a particular attribute, or (c) presents a correlational or causal relationship between two subjects.

4. A test item will be based on a single statement selected from the supplement. If the supplement statement contains multiple parallel elements, only one of the elements will be used in the test item.

   Example of a supplement statement with multiple parallel elements

   Every child needs to be immunized against polio, diphtheria, tetanus, pertussis (whooping cough), measles, mumps, and rubella.

5. A test item will present a supplement statement in either accurate or inaccurate form. An accurate test item can be created in one of the following two ways:

   a. Direct restatement: Reiterating a statement exactly as it appears on the supplement.

   b. Paraphrase: Rephrasing a supplement statement to communicate the same message in different words. This rephrasing may include substituting synonyms for words in the statement and/or reordering words within the statement. The quantitative portion of a supplement statement may not be paraphrased.

      Example of a test item created by paraphrase

      Supplement statement: Rubella vaccine rarely causes a rash.

      Test Item: Only rarely will a rash result from a rubella vaccination.

6. An inaccurate test item will be based on a supplement statement or a paraphrase of that statement. An inaccurate item can be created in one of the following three ways:

   a. Negation: Rewording a supplement statement to have the opposite meaning. If the statement is worded positively, negation is accomplished by adding a negative word or phrase to the statement. If the statement is worded negatively, negation is accomplished by taking out a negative word or phrase.

      Example of a test item created by negation

      Supplement statement: Immunization for tetanus produces no known serious side effects.

Test item: Immunization for tetanus produces serious side effects.

b. Mutual exclusivity: Transforming a supplement statement to communicate a message that is mutually exclusive with the original message. This transformation can be accomplished by either (1) changing a single verb, adjective, or adverb in the original statement to a word or phrase with a contradictory meaning, (2) changing a comparative statement to either reverse the direction of the comparison made or make both terms being compared equal, or (3) changing a quantitative value to one that is different than the one given. A quantitative change must result in a new value that makes the original statement false, rather than a value that allows the statement to remain true because it represents a subset of the original statement. A quantitative change must be expressed in the same terms as the original value.

Examples of test items created by transformation to a mutually exclusive statement

Supplement statement: If a child does not receive an immunization at the correct time, that child's chances of getting the disease increase.

Test item: If a child does not receive an immunization at the correct time, that child's chances of getting the disease remain the same.

Supplement statement: Side effects from vaccines usually develop within four weeks of vaccination.

Test item: Side effects from vaccines usually develop six weeks or more after immunization.

7. A test item will contain a maximum of 25 words. These words will be no higher than an eighth grade reading level on the IOX Basic Skills Word List. Technical terms not found on the word list may be used only if they are listed on the Technical Terms Supplement.

8. A test will contain an approximately equivalent number of accurate and inaccurate test items. These items will be selected according to the following procedures:

   a. One item will be randomly selected from each section of the supplement.

   b. The rest of the items will be randomly selected from the supplement as a whole.

c. All of the items will be reviewed by content experts and modified as needed based upon this review.

9. All of the procedures for creating accurate and inaccurate test items will be used as equally as possible, with the exception of negation of a positively-stated supplement statement. This type of change will be used only when no other transformation is possible, as it results in a test item which requires the respondent to recognize that a negatively-stated idea is not accurate, in effect creating a double negative.

RESPONSE ATTRIBUTES

1. Two response columns will be provided. One column will be labeled "TRUE" and the other will be labeled "FALSE."

2. The correct answer to a question will be "TRUE" if the statement is accurate, or "FALSE" if the statement is inaccurate.

SPECIFICATIONS SUPPLEMENT

IMMUNIZATION INFORMATION

Need for immunization

1. Immunization is the process of giving a vaccine to an individual.

2. Vaccines are substances which increase the body's resistance or immunity to a disease and decrease an individual's chances of getting the disease.

3. Single vaccines protect an individual from one disease.

4. Combined vaccines protect an individual from several different diseases.

5. If a child does not receive an immunization at the correct time, that child's chances of getting the disease increase.

6. Children with fevers of more than 105°F should not be immunized until they are better.

7. Every child needs to be immunized against polio, diphtheria, tetanus, pertussis (whooping cough), measles, mumps, and rubella.

8. Travelers to foreign countries should find out about the immunization requirements of the countries they will be visiting and receive all appropriate vaccines.

Possible Side Effects

9. Although serious side effects are rare, all vaccines can produce them.

10. Side effects from vaccines usually develop within four weeks of vaccination.

11. Visits to a doctor's office, hospital, or clinic because of side effects from a vaccination should be reported to the institution which provided the vaccination.

12. Side effects from vaccines for specific diseases occur with the same frequency whether the vaccines are given in the single or combined form.

Immunization Record Cards

13. An immunization record card provides dates, authorizations, and other important information about a person's immunization status.

14. Parents or guardians should keep written, up-to-date immunization records for each of their children.

15. State-authorized immunization record cards are usually available from a doctor or clinic.

16. A child's immunization record card should be taken whenever one brings a child to a doctor's office or clinic.

17. Proof of immunization, as found on an up-to-date immunization record, is required by law in most states to register children for school or day-care.

18. Immunization record cards should be kept, particularly if a person moves to a different city or state.

Vaccinations for Diphtheria, Tetanus, and Pertussis (Whooping Cough)

19. DTP is a combined vaccine used for diphtheria, tetanus, and pertussis (whooping cough).

20. A child should receive DTP vaccinations three times during the first year of life, at 18 months, and just before entering kindergarten or school.

21. Children who have not received all the shots in the DTP series only need to make up the ones that they have missed.

22. Common reactions to a DTP vaccination are soreness, a lump at the injection site, and a fever for 12 to 24 hours after vaccination.

23. Individuals who develop high fevers, drowsiness, or convulsions after the first DTP injection, should be watched carefully by a doctor if given later vaccinations.

24. A complete diphtheria immunization protects an individual for about 10 years.

25. Immunization for tetanus produces no known serious side effects.

26. People should receive a tetanus booster shot every 10 years after the last dose.

27. Because pertussis (whooping cough) is not a major problem in older children and adults, people seven years of age or older do not need to be immunized against it.

28. Children seven years of age and older who have not received the DTP series should be given a series of three doses of Td (Tetanus and Diphtheria Toxoids).

Vaccinations for Measles, Mumps, and Rubella

29. MMR is a combined vaccine given for measles, mumps, and rubella.

30. Children who have had either the single measles, mumps, or rubella vaccine can be given MMR vaccine for the other diseases.

31. Individuals should not be given MMR vaccine if they might be pregnant, have any form of cancer, are being treated with drugs that reduce the activity of the immune system, have a severe fever, or have had a recent plasma or blood transfusion.

32. 90 to 95% of the persons receiving one dose of measles vaccine will be protected.

33. 5 to 15% of the children immunized against measles have a mild fever and rash within 10 days.

34. More than 90% of persons receiving one dose of mumps vaccine will be protected.

35. Fever and swelling of the salivary glands is rare after vaccination for mumps.

36. Women of child bearing age who have not been vaccinated for or had rubella should be vaccinated.

37. Women should not be vaccinated for rubella if they are pregnant or are trying to get pregnant within the next three months.

38. At least 95% of persons receiving one dose of rubella vaccine will be protected.

39. Rubella vaccine leads to temporary arm, leg, or joint pains in approximately 1% of young children and 5-10% of teenagers vaccinated.

40. Rubella vaccine rarely causes a rash.

Vaccinations for Polio

41. Oral Polio Vaccine (OPV) is the most commonly used polio vaccine.

42. OPV should be given in four doses: twice during the first year of life, at 18 months, and just before a child enters school or preschool.

43. Children who have not received all the doses in the polio series only need to make up the ones that they have missed.

44. The OPV series protects over 90% of the persons receiving it.

45. OPV causes paralysis in 1 out of every several million persons vaccinated.

46. Inactivated Polio Vaccine (IPV) is the polio vaccine of choice for adults who have never been immunized.

TECHNICAL TERMS SUPPLEMENT

IMMUNIZATION INFORMATION

cancer
convulsions
diphtheria
hepatitis
immune
immunization
measles
mumps
pertussis (whooping cough)
polio
rubella
salivary gland
tetanus
transfusion
vaccine

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TEST SPECIFICATIONS

IMMUNIZATION GUIDELINES

GENERAL DESCRIPTION

Immunization providers are presented with statements about appropriate immunization practice. Immunization providers indicate whether each statement is true or false.

SAMPLE ITEM

> **This test consists of 20 statements about immunization. Some of the statements are true and some are false. If you think a statement is true, put a check in the column labeled TRUE. If you think a statement is false, put a check in the column labeled FALSE.**

TRUE	FALSE		
____	____	1.	Providers should follow the manufacturer's instructions for the vaccine being administered.

STIMULUS ATTRIBUTES

1. A test item will consist of a single-sentence statement that the individual is to judge as true or false. This statement will contain information related to appropriate immunization practice. Immunization information includes who should be immunized, when immunization should occur, the effects of immunization, the conditions that affect the success of an immunization, and the storage and handling requirements of various vaccines.

2. All test items will be derived from the specifications supplement Immunization Guidelines. This supplement presents statements about immunization which are based upon either empirical evidence or expert consensus. The statements are organized into sections, with each section containing information about one aspect of immunization practice.

3. Each statement on the supplement consists of one main idea related to immunization. A statement either (a) describes the nature or effects of a particular subject, (b) compares two subjects with respect to a particular attribute, or (c) presents a correlational or causal relationship between two subjects.

4. A test item will be based on a single statement selected from the supplement. If the supplement statement contains multiple parallel elements, only one of the elements will be used in the test item.

   Example of a supplement statement with multiple parallel elements

   Uncommon reactions to mumps immunization include rash, pruritis, purpura, febrile seizures, unilateral nerve deafness, and encephalitis.

5. A test item will present a supplement statement in either accurate or inaccurate form. An accurate test item can be created in one of the following two ways:

   a. Direct restatement: Reiterating a statement exactly as it appears on the supplement.

   b. Paraphrase: Rephrasing a supplement statement to communicate the same message in different words. This rephrasing may include substituting synonyms for words in the statement and/or reordering words within the statement. The quantitative portion of a supplement statement may not be paraphrased.

      Example of a test item created by paraphrase

      Supplement statement: All children should be given a supplementary dose of OPV before entering school.

      Test Item: A supplementary dose of OPV should be given to all children before they enter school.

6. An inaccurate test item will be based on a supplement statement or a paraphrase of that statement. An inaccurate item can be created in one of the following three ways:

   a. Negation: Rewording a supplement statement to have the opposite meaning. If the statement is worded positively, negation is accomplished by adding a negative word or phrase to the statement. If the statement is worded negatively, negation is accomplished by taking out a negative word or phrase.

Example of a test item created by negation

Supplement statement: There is no evidence that post-exposure immunization will prevent or reduce the development of rubella.

Test item: There is evidence that post-exposure immunization will prevent or reduce the development of rubella.

b. Mutual exclusivity: Transforming a supplement statement to communicate a message that is mutually exclusive with the original message. This transformation can be accomplished by either (1) changing a single verb, adjective, or adverb in the original statement to a word or phrase with a contradictory meaning, (2) changing a comparative statement to either reverse the direction of the comparison made or make both terms being compared equal, or (3) changing a quantitative value to one that is different than the one given. A quantitative change must result in a new value that makes the original statement false, rather than a value that allows the statement to remain true because it represents a subset of the original statement. A quantitative change must be expressed in the same terms as the original value.

Examples of test items created by transformation to a mutually exclusive statement

Supplement statement: Persons born before 1957 are considered to be immune to mumps due to prior exposure.

Test item: Persons born after 1957 are considered to be immune to mumps due to prior exposure.

Supplement statement: A complete diphtheria immunization protects an individual for approximately 10 years.

Test item: A complete diphtheria immunization protects an individual for 15 years.

7. A test item will contain a maximum of 25 words.

8. A test will contain an approximately equivalent number of accurate and inaccurate test items. These items will be selected according to the following procedures:

   a. One item will be randomly selected from each section of the supplement.

b. The rest of the items will be randomly selected from the supplement as a whole.

c. All of the items will be reviewed by content experts and modified as needed based upon this review.

9. All of the procedures for creating accurate and inaccurate test items will be used as equally as possible, with the exception of negation of a positively-stated supplement statement. This type of change will be used only when no other transformation is possible, as it results in a test item which requires the respondent to recognize that a negatively-stated idea is not accurate, in effect creating a double negative.

RESPONSE ATTRIBUTES

1. Two response columns will be provided. One column will be labeled "TRUE" and the other will be labeled "FALSE."

2. The correct answer to a question will be "TRUE" if the statement is accurate, or "FALSE" if the statement is inaccurate.

SPECIFICATIONS SUPPLEMENT

IMMUNIZATION GUIDELINES

General

1. All children are required by law to be immunized before entering school.

2. Exemptions to immunization requirements may vary according to state law.

3. Single vaccines protect an individual from one disease.

4. Combined vaccines protect an individual from several different diseases.

5. All immunization providers should be aware of the symptoms of reactions to vaccines and the emergency procedures for dealing with such reactions.

6. Providers should follow the manufacturer's instructions for the vaccine being administered.

7. Recipients of immunizations or their parents or guardians must be informed of the potential dangers of immunization.

8. Although serious side effects are rare, all vaccines can produce them.

Immunization Records

9. All patients should be told that if they become ill and visit a doctor's office, hospital, or clinic in the four weeks after immunization, they should report their visit to the person or agency who gave them the immunization.

10. Providers should maintain complete records on each person immunized.

11. Patient records should include: the date vaccine(s) are given, vaccine manufacturer, vaccine lot number, volume of vaccine administered, site of injection, and reported reactions.

12. All immunizations should be recorded on the patient's state-authorized immunization record card.

Immunization for Diphtheria, Tetanus, and Pertussis

13. DTP is a combined vaccine for diphtheria, tetanus, and pertussis (whooping cough).

14. Td (Tetanus and Diphtheria Toxoids, adult type) is a vaccine for persons seven years of age or older.

15. DT (Diphtheria and tetanus toxoids, Pediatric type) is a vaccine for infants and children less than seven years old who are contraindicated for pertussis vaccine.

16. Because pertussis may be less severe in children seven years of age or older, and because a reaction to the pertussis part of the vaccine may be more common in older children, the DTP vaccine is used with children younger than seven years old and Td is used with children seven years of age or older.

17. The DTP vaccine should be given on five occasions.

18. The first three doses of DTP should be given during the first year of life, the fourth dose should be given approximately one year after the third immunization, and the fifth (booster) dose should be given before age seven years and prior to entering kindergarten or elementary school.

19. Persons who are ill, who have had convulsions or other problems of the central nervous system, or who have had earlier serious reactions to DTP shots, should be checked by a doctor before receiving a DTP shot.

20. Three primary doses of the Td vaccine should be given.

21. The second dose of Td should be given four to eight weeks after the first dose, and the third dose of Td should be given six months to one year after the second dose.

22. Individuals seven years of age or older who have completed either the DTP or Td series should be given a Td booster shot every 10 years.

23. Individuals who have received a Td injection for wound management need not be given a Td booster until 10 years after the wound management injection.

24. The DTP and Td vaccines should always be administered intra-muscularly.

25. A complete diphtheria immunization protects an individual for approximately 10 years.

26. People should receive a tetanus booster shot every 10 years after their last dose.

27. Pertussis immunization should not be repeated if any central nervous system disorder or thrombocytopenia develops within 48 hours of a DTP injection.

Immunization for Measles, Mumps, and Rubella

28. Measles, mumps, and rubella live attenuated virus vaccines are available in monovalent forms (one type of virus only) and in combinations: measles-rubella (MR) and measles-mumps-rubella (MMR).

29. Single or combination vaccines for measles, mumps, and rubella should optimally be given at the age of 15 months.

30. Persons over 6 months of age with a known high likelihood of exposure to measles, mumps, or rubella should be immunized against these diseases regardless of age.

31. Single or combined measles, mumps, and rubella vaccines should not be administered to pregnant females or women who expect to become pregnant in the next three months.

32. Single or combination vaccines for measles, mumps, and rubella should not be administered for at least three months after a patient has received Immune Serum Globulin (ISG).

33. Patients with immune deficiency diseases and suppressed immune responses that occur either with leukemia, lymphoma, or generalized malignancy, or patients receiving therapy with corticosteroids, alkylating drugs, antimetabolitis, or radiation, should not be given single or combination vaccines for measles, mumps, or rubella.

34. Because a small percentage of patients are allergic to antibiotics, labels for single or combination measles, mumps, and rubella vaccines should be checked for the presence of antibiotics.

35. Children immunized for measles, mumps, or rubella before the age of 12 months should be reimmunized after the age of 15 months.

36. Persons born before 1957 are considered to be immune to mumps due to prior exposure.

37. Adverse reactions from measles, mumps, and rubella vaccines occur with the same frequency whether the vaccines are administered in single or combined form.

38. 5 to 15% of all children immunized against measles may develop a mild fever or rash within 10 days of vaccination.

39. Measles vaccine may lead to brain disorders in only 1 out of every 1,000,000 persons vaccinated.

40. Uncommon reactions to mumps immunization include rash, pruritus, purpura, febrile seizures, unilateral nerve deafness, and encephalitis.

41. Side effects to rubella vaccine include rash, lymphadenopathy, and joint pain.

42. The presence of a pregnant female in the household is not a contraindication for rubella immunization of another susceptible member of the household.

43. There is no evidence that post-exposure immunization will prevent or reduce the development of rubella.

Immunization for Polio

44. Two types of polio vaccines are currently used in the United States: Oral Polio Vaccine (OPV) and Inactivated Polio Vaccine (IPV).

45. OPV is a live attenuated vaccine combining all three types of polio virus.

46. OPV is the most frequently used polio vaccine in the United States.

47. OPV should not be routinely administered to adults 18 years of age or older.

48. The OPV series consists of three primary doses and a supplementary dose.

49. The OPV series is generally begun at 6-12 weeks of age.

50. The first two doses of OPV should be given eight weeks apart, and the third dose should be given 8-12 months after the second dose.

51. All children should be given a supplementary dose of OPV before entering school.

52. OPV should not be administered to patients with immune deficiency diseases, patients with malignancies, patients receiving immunosuppressive drugs, patients receiving radiation, or to individuals who will have close contact with individuals with suppressed immune function.

53. 1 out of every several million individuals who receives OPV develops paralysis.

54. IPV should be given to individuals with suppressed immune function or to people in close contact with such individuals.

55. IPV has no known severe side effects.

56. The IPV series consists of four primary doses and a booster dose at 5 year intervals.

57. Routine polio immunization of adults 18 years of age or older is not necessary.

58. IPV is the vaccine of choice for adults who are at greater risk of exposure, such as travelers to places where polio is epidemic or endemic, exposed laboratory workers, or health care workers in close contact with possible polio infection.

Storage, Handling, and Administration of Vaccines

59. DTP, Td, and single or combined measles, mumps, and rubella vaccines should be stored at 2-8°C (35-46°F).

60. DTP retains its potency for up to 18 months, according to the manufacturer's expiration date.

61. Td retains its potency for up to two years, according to the manufacturer's expiration date.

62. Exposure of single or combined measles, mumps, and rubella vaccines to light before or after reconstitution will destroy the vaccine.

63. Unreconstituted single or combined measles, mumps, and rubella vaccines retain their potency for up to two years, according to the manufacturer's expiration date.

64. Reconstituted single or combined measles, mumps, and rubella vaccines must be discarded if not used within eight days.

65. Single or combined measles, mumps, and rubella vaccines should be reconstituted with the diluent supplied by the manufacturer of the vaccine.

66. Polio vaccines should be stored at -10°C (14°F) or lower.

67. When kept frozen continuously, polio vaccine will retain its potency for 12 months, according to the manufacturer's expiration date.

68. Unopened polio vaccine can be kept in a liquid state at 2-8°C (35-49°F) for up to 30 days.

69. Once opened, polio vaccine must be kept refrigerated between doses and used within seven days.

70. Polio vaccine should not be refrozen after opening.

71. Expiration dates on all vaccine containers must be checked to ensure that vaccines are still potent.

72. All materials used for administering live attenuated vaccines should be incinerated, boiled, or autoclaved prior to disposal.

73. DTP, OPV, and MMR vaccines may be, but are not usually, given to the same person at the same time.

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TEST SPECIFICATIONS
HANDLING VACCINES

GENERAL DESCRIPTION

Immunization providers are presented with descriptions of situations in which a health care provider must either store, prepare, or administer a vaccine. Immunization providers are asked to select the best course of action from among four possible options. The correct action will be consistent with accepted standards for the storage, preparation, and administration of specific vaccines.

SAMPLE ITEM

> **This test presents situations in which health care providers must store, prepare, or administer various vaccines.**
>
> **Read each description. Then circle the letter of the best action for the person to take.**

1. Janice Swit received a frozen shipment of Oral Polio Vaccine (OPV). The vaccine will not be used for two months. The best action for Janice to take is to:

   A. Store the vaccine in a dark room at 2° to 8°C (35° to 46°F). (inappropriate for specified vaccine)

   B. Store the vaccine at 15° to 30°C (59° to 85°F). (inappropriate for specified vaccine)

   C. Store the vaccine at -10°C (14°F) or lower. (correct)

   D. Open the vaccine to check its condition. (always inappropriate)

STIMULUS ATTRIBUTES

1. A test item will begin with a brief description of a situation in which a health care provider must store, prepare, or administer a vaccine. The description will be followed by the directive, "The best action for (name of provider) to take is to:"

2. The situation description will contain the following elements:

   a. a statement identifying the type of vaccine

   b. a statement of the condition of the vaccine (e.g., frozen or thawed)

   c. a statement describing the vaccine's anticipated use and/or the time frame for that use

3. Eligible vaccines, by categories, are:

   a. Diphtheria, Tetanus, Pertussis, DTP, Td

   b. Measles, Rubella, MR, MMR

   c. Polio, OPV

4. There will be an approximately proportionate number of items for each of the eligible vaccine categories.

5. The stimulus portion of a test item will be no more than 50 words in length.

RESPONSE ATTRIBUTES

1. Four answer choices will follow each question. Each choice will describe a plausible action that a provider might take to store, prepare, or administer the vaccine, given its type, condition (including shipping conditions if given), and anticipated use.

2. The correct answer choice for a test question will be an appropriate procedure for storing, preparing, or administering the vaccine, given its type, condition and the description of its anticipated use. This procedure will be consistent with the following guidelines for vaccine handling:

   a. Diphtheria, Tetanus, Pertussis, DTP, or Td vaccines

      (1) May be out of refrigeration for up to 4 days during shipment.

      (2) Store at 2° to 8°C (35° to 46°F).

      (3) Do not freeze.

      (4) May be refrigerated and stored for 18 months according to the expiration date.

(5) Thoroughly mix vaccine before administering.

(6) Administer intramuscularly.

b. Measles, Rubella, MR, MMR

(1) Must be shipped at 10°C (50°F) or less, but not in dry ice.

(2) Store and prepare in the absence of light.

(3) Store unreconstituted vaccine at 2° to 8°C (35° to 46°F) for up to two years according to the expiration date.

(4) Use only diluent supplied by the manufacturer of the vaccine.

(5) Diluent should be stored at 15° to 30°C (59° to 86°F).

(6) Use reconstituted vaccines only if clear.

(7) Store reconstituted vaccine for no more than 8 hours at 2° to 8°C (35° to 46°F) and in a dark place.

(8) Administer subcutaneously.

c. Polio, OPV

(1) Must be shipped at -10°C (14°F) or lower.

(2) A vaccine shipment which arrives thawed but below 8°C (46°F) should be refrozen immediately.

(3) Store frozen, unopened vaccine for no more than 12 months according to the expiration date.

(4) Store unopened vaccine in the frozen state -10°C (14°F) or lower, unless the vaccine will be used within 30 days.

(5) If unopened vaccine thaws for a total of more than 24 hours or has been through 10 freeze-thaw cycles, store at 2° to 8°C (35° to 46°F) for no more than 30 days.

(6) If at any time the vaccine exceeds 8°C (46°F), dispose of the vaccine.

(7) Store unopened vaccine at 2° to 8°C (35° to 46°F) for no more than 30 days.

(8) Store opened vaccine at 2° to 8°C (35° to 46°F) for no more than 7 days.

(9) Administer OPV orally.

3. If a test question presents circumstances which are a violation of any of the storage or preparation guidelines specified in Response Attributes 2a-2c above, the correct answer choice will be to dispose of the vaccine so that it cannot be administered.

4. An incorrect answer choice for a test question will describe an inappropriate procedure for storing, preparing, or administering the vaccine, given its type, its condition, and the description of its anticipated use. Incorrect answers will be selected from the following:

   a. Storing, preparing, or administering a vaccine in a way that is inappropriate for any vaccine. The following procedures are eligible for inclusion under this category:

      (1) Storing a vaccine in a refrigerator door.

      ✓ (2) Exposing a vaccine to the air by opening it for any reason other than its preparation and administration.

      (3) Storing a vaccine at 8°C (46°F) or higher after shipment.

      (4) Administering a vaccine that has been stored at 8°C (46°F) or higher.

      (5) Administering a vaccine after its expiration date.

      (6) Intravenous administration of vaccines.

   b. Storing, preparing, or administering a vaccine in a way that is inappropriate for that vaccine. Response options in this category include:

      (1) Handling a vaccine according to directions appropriate for another vaccine (e.g., administering OPV intramuscularly).

(2) Storing, preparing, or administering the specified vaccine in a way that is a direct violation of the appropriate procedures as described in Response Attributes #2 (e.g., storing polio vaccine in a frozen state for more than 12 months).

(3) Administering a vaccine that has been inactivated by violation of any of the guidelines specified in Response Attributes #2.

c. Unnecessary disposal of a vaccine that is still active.

The consequences of an incorrect action can range from causing the vaccine to become inert or reduced in potency, to causing the vaccine to become contaminated and, therefore, possibly harmful to the patient.

4. Answer choices will be no longer than 30 words in length.

TEST SPECIFICATIONS

DECIDING WHETHER TO IMMUNIZE

GENERAL DESCRIPTION

Immunization providers are presented with descriptions of individuals who have come for immunizations. Immunization providers are asked to decide whether it is appropriate or contraindicated to immunize each individual.

SAMPLE ITEM

> **This test presents descriptions of people under your regular care who are seeking immunization. If you think that it is appropriate to immunize an individual, check YES. If you think that immunization is contraindicated for the individual, check NO.**

1. Mrs. Jones brings her healthy one-year-old son Robert in for his second DTP immunization. The nurse learns from Robert's mother that when Robert received his first DTP immunization eight weeks ago, he developed a fever of 105°F shortly after the immunization. Is it appropriate to give Robert DTP vaccine?

   ____ Yes (incorrect)

   ____ No (correct)

STIMULUS ATTRIBUTES

1. Each test item will begin with a description of a patient who has come for an immunization. The description will be followed by the question, "Is it appropriate to give (name of patient) (name of vaccine) vaccine?

2. Each description will contain the following elements:

   a. the age of the patient

   b. the vaccine being sought

   c. a statement describing the present and/or past health condition of the patient

   d. a statement identifying any family or household conditions that may be relevant to the vaccine

   e. a statement identifying any past reaction to the specified vaccine, unless this is the first time the vaccine has been administered

   f. the elapsed time since a previous vaccine, unless this is the first time the vaccine has been administered

   g. for females of reproductive age, a statement to indicate if they are pregnant or intend to become pregnant

3. The following vaccines will be eligible for inclusion: DTP, Td, MMR, and OPV.

4. The stimulus portion of a test item will be no longer than 80 words in length.

RESPONSE ATTRIBUTES

1. Two answer choices will follow each test question. The two choices will be YES and NO.

2. The correct answer to a question will be YES if it is appropriate to immunize the patient, and NO if the patient should not be immunized.

3. The following conditions or symptoms are routinely considered contraindications for each vaccine:

   a. DTP vaccine - This vaccine should not be given if:

      (1) A patient is less than six weeks old.

      (2) It has been less than four weeks since a patient's first or second vaccine.

      (3) For the fourth vaccine, it has been less than six months since the third vaccine or the patient is less than one year old.

      (4) The patient is seven years old or older.

      (5) There is a history of a very high fever and/or unusual behavior or neurological symptoms attributable to receiving a prior vaccine.

(6) The patient is suffering from a febrile illness at the time of the vaccine.

b. Td vaccine - This vaccine should not be given if:

(1) The patient is less than seven years old.

(2) It has been less than four weeks since the first Td vaccine.

(3) It has been less than six months since the second Td vaccine.

(4) It has been less than five years since the third vaccine or last booster shot.

(5) The patient is suffering from febrile illness at the time of the vaccine.

c. MMR Vaccine - This vaccine should not be given if:

(1) The patient is less than 12 months old.

(2) The patient is pregnant or anticipates becoming pregnant within three months of the vaccine.

(3) The patient has received Immune Serum Globulin (ISG) within the last three months.

(4) The patient has an immune deficiency disease and suppressed immune responses that occur with leukemia, lymphoma, or generalized malignancy, or the individual is receiving therapy with corticosteroids, alkylating drugs, antimetabolites, or radiation.

(5) The patient is suffering from a febrile illness at the time of the vaccine.

d. Polio Vaccine (OPV) - This vaccine should not be given if:

(1) The patient is less than 6 weeks old.

(2) The patient is 18 years old or older unless the patient had previously started the series.

(3) It has been less than six weeks since the first or second vaccine.

(4) The patient or household contact is pregnant, or has an immune deficiency disease or malignancy, or is receiving immunosuppressive drugs or radiation, or will be in close contact with persons who have suppressed immune function.

(5) The patient is suffering from severe febrile illness at the time of immunization.

4. A test will consist of an approximately equivalent number of items in which it is appropriate and in which it is inappropriate to immunize a patient.

TEST SPECIFICATIONS

IDEAS ABOUT IMMUNIZATION

GENERAL DESCRIPTION

This inventory is a Likert scale in which respondents are asked to register their degree of agreement with a series of statements about the importance of immunization. These statements treat one's personal susceptibility to communicable diseases, children's susceptibility to communicable diseases, the personal consequences of communicable diseases, the consequences of communicable diseases for children, the low cost of immunization, its high level of effectiveness for protection against disease, the relative safety of immunization, the importance of maintaining immunization records, and the importance of bringing those records to health care providers at appropriate times.

SAMPLE ITEM

This survey asks your opinions about immunization against communicable diseases such as measles, mumps, rubella, influenza, and polio.

Read each statement. Decide the extent to which you agree with it. Circle the appropriate letter to the left of the statement. Use the following scale:

SA = Strongly Agree
A = Agree
U = Uncertain
D = Disagree
SD = Strongly Disagree

SA A U D SD 1. There is little chance anymore that children will get communicable diseases.

STIMULUS ATTRIBUTES

1. An item will state a possible attitude toward immunization. These attitudes include one's personal susceptibility and children's susceptibility to communicable disease, the personal consequences and consequences to

children of contracting a communicable disease, the low cost and high level of effectiveness of immunization, the relative safety of immunization, and the importance of maintaining and bringing immunization records at appropriate times.

2. The inventory will contain a proportionate number of items in each of eight categories: personal susceptibility to communicable disease, children's susceptibility to communicable disease, personal consequences of contracting a communicable disease, consequences of children contracting a communicable disease, low cost of immunization, high level of effectiveness of immunization, the relative safety of immunization, the need to keep records of immunizations, and the need to bring records to health care providers at appropriate times. For each category of belief, there will be a proportionate number of items indicative of acceptance and of failure to accept the importance of immunization.

3. Each statement will be 25 words or less in length. The words used will not exceed the eighth grade level on the IOX Basic Skills Word List with the exception of the words "immune" and "communicable."

RESPONSE ATTRIBUTES

1. The following five response options will be available for each item:

SA = Strongly Agree
A = Agree
U = Uncertain
D = Disagree
SD = Strongly Disagree

2. Respondents are to use the response options to indicate the extent to which their acceptance of the importance of immunization is properly represented in a item's statement. Respondents circle the letter of their response to the left of each item.

SCORING AND INTERPRETATION

1. The rationale underlying this measure is that respondents who have accepted the importance of immunization will more frequently (a) agree with statements which describe immunization as necessary and beneficial and disease as serious, and (b) disagree with statements which describe immunization as unimportant and disease as having little impact.

2. Point values are assigned to items according to whether respondents indicate that immunization is important. Items which describe attitudes consistent with an acceptance of the importance of immunization are assigned the following values: SA = 5 points, A = 4 points, U = 3 points, D = 2 points, SD = 1 point. Items which describe attitudes which are inconsistent with an acceptance of the importance of immunization are assigned the following values: SA = 1 point, A = 2 points, U = 3 points, D = 4 points, SD = 5 points.

3. High scores reflect high levels of acceptance of the importance of immunization.

MEASURE FORMAT

1. The following plan indicates the key characteristics of the "Ideas About Immunization" inventory developed from these test specifications.

Item	Attitude Area	Acceptance of the Importance of Immunization
1	Children's susceptibility to communicable diseases	No
2	Consequences to children of contracting communicable diseases	Yes
3	Maintaining records of immunization	Yes
4	Personal consequences of contracting communicable diseases	No
5	Effectiveness of immunization	Yes
6	Consequences to children of contracting communicable diseases	No
7	Cost of immunization	No
8	Personal susceptibility to communicable diseases	Yes
9	Personal consequences of contracting communicable diseases	Yes
10	Maintaining records of immunization	No
11	Children's susceptibility to communicable diseases	Yes
12	Personal susceptibility to communicable diseases	No
13	Safety of immunization	Yes
14	Bringing records of immunization	No
15	Cost of immunization	Yes
16	Bringing records of immunization	Yes
17	Effectiveness of immunization	No
18	Safety of immunization	No

TEST SPECIFICATIONS
THINK ABOUT IMMUNIZATION

GENERAL DESCRIPTION

This inventory is a Likert scale in which children are asked to register their degree of agreement with a series of statements about the importance of immunization. These statements treat a child's personal susceptibility to disease, the personal consequences of contracting a communicable disease, the effectiveness of immunization for protection against disease, the relative safety of immunization, and the importance of maintaining and bringing immunization records when receiving health care.

SAMPLE ITEM

> **The statements below are about immunization. Circle the word that show how much you agree with each statement.**
>
> **YES = I agree**
> **MAYBE = I am not sure if I agree**
> **NO = I do not agree**

YES MAYBE NO 1. Immunizations can protect me from diseases such as measles and polio.

STIMULUS ATTRIBUTES

1. An item will state a possible attitude toward immunization. These attitudes include one's personal susceptibility to communicable diseases, the personal consequences of getting a communicable disease, the effectiveness of immunization for protection against communicable diseases, the relative safety of immunization, and the importance of maintaining and bringing records of immunization when receiving health care.

2. The inventory will contain a proportionate number of items about each of the possible attitudes, with equal representation of the possibilities of immunization having a positive consequence and immunization having no impact or a negative effect.

3. Statements will refer either to diseases in general or to one or more of the following specific communicable diseases: measles, mumps, polio, rubella.

4. Each statement will be 18 words or less in length. The words used will not exceed the fourth grade level on the IOX Basic Skills Word List, except for the following words:

   disease
   immunization
   measles
   mumps
   polio
   rubella

RESPONSE ATTRIBUTES

1. The following three response options will be available for each item:

   YES = I agree
   MAYBE = I am not sure if I agree
   NO = I do not agree

2. Children are to use the response options to indicate the extent to which their beliefs about the importance of immunization are properly represented in an item's statement. Children circle their response to the left of each item.

SCORING AND INTERPRETATION

1. The rationale underlying this measure is that children who believe in the importance of immunization will more frequently (a) agree with statements which describe immunization as important and beneficial and disease as serious, and (b) disagree with statements which describe immunization as unimportant and disease as having little impact.

2. Point values are assigned to items according to whether respondents indicate that immunization is important. Items which describe attitudes consistent with an acceptance of the importance of immunization are assigned the following values: YES = 2 points, MAYBE = 1 point, NO = 0 point. Items which describe attitudes which are inconsistent with an acceptance of the importance of immunization are assigned the following values: YES = 0 point, MAYBE = 1 point, NO = 2 points.

3. High scores reflect high levels of acceptance of the importance of immunization.

MEASURE FORMAT

1. The following plan indicates the key characteristics of the "Think About Immunization" inventory developed from these test specifications.

Item	Attitude Area	Acceptance of the Importance of Immunization
1	Effectiveness of immunization	Yes
2	Safety of immunization	No
3	Personal consequences of contracting communicable diseases	No
4	Importance of maintaining records	Yes
5	Personal susceptibility to communicable diseases	No
6	Importance of bringing records	No
7	Personal susceptibility to communicable diseases	Yes
8	Personal consequences of contracting communicable diseases	Yes
9	Importance of maintaining records	No
10	Safety of immunization	Yes
11	Effectiveness of immunization	No
12	Importance of bringing records	Yes

TEST SPECIFICATIONS

WOULD YOU OBTAIN IMMUNIZATION?

GENERAL DESCRIPTION

This measure is designed to assess individuals' intentions to obtain immunizations for communicable diseases. Individuals are presented with a series of situations which might serve as barriers to obtaining immunization and asked to indicate if they intend to obtain immunization in each situation. If they indicate that they would obtain immunization, they are asked to estimate, on a 10 to 100 numerical scale, how confident they are of their intention to obtain immunization in that situation.

SAMPLE ITEM

This survey is about immunization. Immunization means receiving a vaccine that increases the body's resistance to disease and decreases the chances of getting that disease. Among the diseases for which a person can be immunized are measles, mumps, tetanus, influenza, and polio.

The survey describes various situations. Read each statement. Circle YES or NO to show whether, if appropriate, you would obtain immunization in that situation. If you circle YES, then use the Confidence Scale to show how certain you are of your answer.

The following examples show how the Confidence Scale is used.

Physical Strength Examples	**CAN YOU DO THIS?**	**IF YES, HOW CERTAIN ARE YOU?**
You can lift a 50 pound weight.	**[✓ YES]/NO**	70
You can lift a 200 pound weight.	**YES/[✓ NO]**	

Confidence Scale

10	**20**	**30**	**40**	**50**	**60**	**70**	**80**	**90**	**100**
Very Uncertain				**Somewhat Certain**					**Very Certain**

	WOULD YOU OBTAIN IMMUNIZATION?	IF YES, HOW CERTAIN ARE YOU?
1. You are very busy.	YES/NO	______

STIMULUS ATTRIBUTES

1. An item will describe a situation which might serve as a barrier to obtaining immunization. The item will be written in second person and will refer to someone's participation or feelings, for example, "You are very busy."

2. The situations presented in test items will be based on limited resources (time or financial), inconvenience, concern about physical or emotional discomfort, or lack of perceived need for immunization.

3. Situations will be selected to be applicable to most individuals and will be described in terms that are as general as possible so that most respondents will be likely to identify personally with those situations.

4. Each item will be 20 words or less in length. The words used will not exceed the eighth grade level of the IOX Basic Skills Word List with the exception of the word "immunize."

RESPONSE ATTRIBUTES

1. For each item, two response opportunities are available, a YES/NO answer and a confidence rating.

2. Respondents are to use the YES/NO option to indicate whether they intend to obtain immunization in the situation given.

3. If respondents answer YES to an item, they are then to indicate how confident they are that they would obtain immunization in the situation described by selecting a number from the following confidence scale:

Confidence Scale

10	20	30	40	50	60	70	80	90	100
Very Uncertain				Somewhat Certain					Very Certain

SCORING AND INTERPRETATION

1. The rationale underlying this measure is that the more often respondents indicate that they intend, with a high degree of confidence, to obtain immunization, the stronger the intention of those respondents to obtain immunization.

2. This inventory can be scored in several ways, two of which are described here. In the first procedure, the number of YES responses is used as a gross index of an individual's perceived intention to obtain immunization. The more YES responses, the more situations in which individuals believe that they intend to obtain immunization.

   A combined analysis of YES/NO responses and confidence ratings allows for a more complete assessment of program effectiveness, as it incorporates both sources of information in a single index. This analysis is accomplished by computing the mean strength of the rated intention across all items, that is, by dividing the sum of the confidence ratings made in conjunction with "YES" responses by the number of items in the questionnaire. High scores reflect a strong perceived intention to obtain immunization in a variety of situations, along with a high level of confidence in that intention.

MEASURE FORMAT

1. The following plan indicates the key characteristics of the "Would You Obtain Immunization?" inventory developed from these test specifications.

Item	Potential Barrier
1	Limited resources
2	Lack of perceived need for immunization
3	Concern about physical or emotional discomfort
4	Inconvenience
5	Concern about physical or emotional discomfort
6	Lack of perceived need for immunization
7	Limited resources
8	Inconvenience
9	Lack of perceived need for immunization
10	Concern about physical or emotional discomfort
11	Limited resources
12	Lack of perceived need for immunization
13	Concern about physical or emotional discomfort
14	Inconvenience
15	Limited resources
16	Inconvenience

TEST SPECIFICATIONS
IMMUNIZATION FOR CHILDREN

GENERAL DESCRIPTION

This measure is designed to assess parents' or guardians' intentions to obtain immunization for their children. Respondents are presented with a series of situations which might serve as barriers to obtaining immunization for children and asked to indicate if they intend to obtain immunization for their child in each situation. If they indicate that they intend to obtain immunization for their child, they are asked to estimate, on a 10 to 100 numerical scale, how confident they are of their intention to obtain immunization in that situation.

SAMPLE ITEM

This survey is about immunization for children. Immunization means receiving a vaccine that increases the body's resistance to a disease and decreases the chances of getting that disease. Among the diseases for which children can be immunized are measles, mumps, tetanus, and polio.

The survey describes various situations. Read each statement. Circle YES or NO to show whether, if appropriate, you would have your child immunized. If you circle YES, then use the Confidence Scale to show how certain you are of your answer.

The following examples show how the Confidence Scale is used.

Physical Strength Examples	**CAN YOU DO THIS?**	**IF YES, HOW CERTAIN ARE YOU?**
You can lift a 50 pound weight.	**[✓ YES]/NO**	70
You can lift a 200 pound weight.	**YES/[✓ NO]**	____

Confidence Scale

10	**20**	**30**	**40**	**50**	**60**	**70**	**80**	**90**	**100**
Very Uncertain				**Somewhat Certain**					**Very Certain**

	WOULD YOU HAVE YOUR CHILD IMMUNIZED?	IF YES, HOW CERTAIN ARE YOU?
1. You are very busy.	YES/NO	____

STIMULUS ATTRIBUTES

1. An item will describe a situation which might serve as a barrier to obtaining immunization for a child. The item will be written in second person and will refer to someone's participation or feelings, for example, "You have been busy."

2. The situations presented in test items will involve directly or indirectly, limited resources (time or financial), inconvenience, concern about physical or emotional discomfort, or lack of perceived need for immunization.

3. Situations will be selected to be applicable to most individuals. For example, a situation describing an individual's being busy because of a job will not be used because potential respondents might not hold jobs. Situations in which individuals are generally busy, however, would be appropriate.

4. Each item will be 20 words or less in length. The words used will not exceed the eighth grade level of the IOX Basic Skills Word List except for the word "immunize."

RESPONSE ATTRIBUTES

1. For each item, two response opportunities are available, a YES/NO answer and a confidence rating.

2. Respondents are to use the YES/NO option to indicate whether they intend to obtain immunization for a child in the situation given.

3. If respondents answer YES to an item, they are to indicate how confident they are of their intention to obtain immunization for a child in the situation described, by selecting a number from the following confidence scale:

Confidence Scale

10	20	30	40	50	60	70	80	90	100
Very Uncertain				Somewhat Certain					Very Certain

SCORING AND INTERPRETATION

1. The rationale underlying this measure is that the more often respondents indicate that they intend with a high degree of confidence to obtain immunization for their children, the stronger the perceived self-efficacy of those respondents in obtaining immunization for their children.

2. This inventory can be scored in several ways, two of which are described here. In the first procedure, the number of YES responses is used as a gross index of an individual's perceived intention to obtain immunization for a child. The more YES responses, the more situations in which individuals believe that they would obtain immunization for their children.

   A combined analysis of YES/NO responses and confidence ratings allows for a more complete assessment of program effectiveness, as it incorporates both sources of information in a single index. This analysis is accomplished by computing the mean strength of the rated intention across all items, that is, by dividing the sum of the confidence ratings made in conjunction with "YES" responses by the number of items in the questionnaire. High scores reflect a strong perceived intention to obtain immunization for children in a variety of situations, along with a high level of confidence in that intention.

MEASURE FORMAT

1. The following plan indicates the key characteristics of the "Immunization for Children" inventory developed from these test specifications.

Item	Potential Barrier
1	Limited resources
2	Lack of perceived need for immunization
3	Concern about physical or emotional discomfort
4	Inconvenience
5	Concern about physical or emotional discomfort

Item	Potential Barrier
6	Lack of perceived need for immunization
7	Limited resources
8	Inconvenience
9	Lack of perceived need for immunization
10	Concern about physical or emotional discomfort
11	Limited resources
12	Lack of perceived need for immunization
13	Concern about physical or emotional discomfort
14	Inconvenience
15	Limited resources
16	Inconvenience

TEST SPECIFICATIONS

KEEPING TRACK

GENERAL DESCRIPTION

This measure is designed to assess individuals' intention to maintain immunization records for themselves and their children, if any. Individuals are presented with a series of situations which serve as barriers to maintaining immunization records and are asked to indicate if they intend to maintain immunization records in each situation. If they indicate that they intend to maintain immunization records, they are asked to estimate, on a 10 to 100 numerical scale, how confident they are of their intention to maintain records in that situation.

SAMPLE ITEM

This survey is about maintaining immunization records for yourself and for your children, if you have any. Maintaining records requires that you keep your immunization record cards in a safe place where you can easily find them. These cards are the forms used by a doctor or nurse to record each immunization that is given.

The survey describes various situations. Read each statement. Circle YES or NO to show if you would maintain immunization records. If you circle YES, then use the Confidence Scale to show how certain you are of your answer.

The following examples show how the Confidence Scale is used.

Physical Strength Examples	**CAN YOU DO THIS?**	**IF YES, HOW CERTAIN ARE YOU?**
You can lift a 50 pound weight.	[✓ YES]/NO	70
You can lift a 200 pound weight.	YES/[✓ NO]	___

Confidence Scale

10	20	30	40	50	60	70	80	90	100
Very Uncertain				Somewhat Certain					Very Certain

	WOULD YOU MAINTAIN IMMUNIZATION RECORDS?	IF YES, HOW CERTAIN ARE YOU?
1. You move rather frequently.	YES/NO	____

STIMULUS ATTRIBUTES

1. An item will describe a situation which might serve as a barrier to maintaining immunization records.

2. The situations presented in test items will involve directly or indirectly, change in location, general disorganization, confusion about the record, lack of perceived importance of the record, or a lack of perceived responsibility for maintaining the record.

3. Situations will be selected to be applicable to most individuals. For example, a situation describing an individual's being busy because of a job will not be used because potential respondents might not hold jobs. Situations in which individuals are generally busy, however, would be appropriate.

4. Each item will be 20 words or less in length. The words used will not exceed the eighth grade level of the IOX Basic Skills Word List with the exception of the word "immunize."

RESPONSE ATTRIBUTES

1. For each item, two response opportunities are available, a YES/NO answer and a confidence rating.

2. Respondents are to use the YES/NO option to indicate whether they intend to maintain immunization records in the situation given.

3. If respondents answer YES to an item, they are to indicate how confident they are that they would maintain immunization records in the situation described, by selecting a number from the following confidence scale:

Confidence Scale

10	20	30	40	50	60	70	80	90	100
Very Uncertain				Somewhat Certain					Very Certain

SCORING AND INTERPRETATION

1. The rationale underlying this measure is that the more often respondents indicate that they intend, with a high degree of confidence, to maintain immunization records, the stronger the intention of those respondents to maintain immunization records for themselves and for their children.

2. This inventory can be scored in several ways, two of which are described here. In the first procedure, the number of YES responses is used as a gross index of an individual's perceived intention to maintain immunization records. The more YES responses, the more situations in which individuals believe that they will maintain immunization records.

   A combined analysis of YES/NO responses and confidence ratings allows for a more complete assessment of program effectiveness, as it incorporates both sources of information in a single index. This analysis is accomplished by computing the mean strength of the rated intention across all items, that is, by dividing the sum of the confidence ratings made in conjunction with "YES" responses by the number of items in the questionnaire. High scores reflect a strong intention to maintain immmunization records across a variety of settings, along with a high level of confidence in that intention.

MEASURE FORMAT

1. The following plan indicates the key characteristics of tne "Keeping Track" inventory developed from these test specifications.

Item	Potential Barrier
1	Change in location
2	Lack of perceived responsibility for maintaining the record
3	General disorganization
4	Lack of perceived importance of the record
5	Confusion about the record
6	Change in location
7	General disorganization
8	Lack of perceived responsibility for maintaining the record
9	Confusion about the record
10	Lack of perceived importance of the record

TEST SPECIFICATIONS

BRINGING RECORDS FOR YOUR CHILD

GENERAL DESCRIPTION

This measure is designed to assess parents' or guardians' intentions to bring immunization records whenever they bring their children for health care. Individuals are presented with a series of situations which might serve as barriers to bringing immunization records and are asked to indicate if they would bring immunization records in each situation. If they indicate that they would bring their child's immunization record, then they are asked to estimate, on a 10 to 100 numerical scale, how confident they are that they would bring records in that situation.

SAMPLE ITEM

This survey is about bringing your child's immunization record card with you whenever your child gets health care. An immunization record card is the form used by a doctor or nurse to record each immunization that is given.

This survey describes various situations. Read each statement. Circle YES or NO to show if you would bring your child's immunization record. If you circle YES, then use the Confidence Scale to show how certain you are of your answer.

The following examples show how the Confidence Scale is used.

Physical Strength Examples	**CAN YOU DO THIS?**	**IF YES, HOW CERTAIN ARE YOU?**
You can lift a 50 pound weight.	[✓ YES]/NO	70
You can lift a 200 pound weight.	YES/[✓ NO]	

Confidence Scale

10	20	30	40	50	60	70	80	90	100
Very Uncertain				Somewhat Certain					Very Certain

	WOULD YOU BRING YOUR CHILD'S IMMUNIZATION RECORD?	IF YES, HOW CERTAIN ARE YOU?
1. You are running late for your child's appointment.	YES/NO	_____

STIMULUS ATTRIBUTES

1. An item will describe a situation which might serve as a barrier to a parent or guardian bringing their child's immunization record when obtaining health care. The item will be written in second person and will refer to someone's status or feelings, for example, "You have been very busy."

2. The situations presented in test items will involve directly or indirectly, lack of perceived need for immunization records, lack of perceived responsibility for record keeping, difficulty in locating immunization records, or sense of being rushed before going to the doctor.

3. Situations will be selected to be applicable to most individuals. For example, a situation describing an individual's being busy because of a job will not be used because potential respondents might not hold jobs. Situations in which individuals are generally busy, however, would be appropriate.

4. Each item will be 30 words or less in length. The words used will not exceed the eighth grade level of the IOX Basic Skills Word List with the exception of the word "immunization."

RESPONSE ATTRIBUTES

1. For each item, two response opportunities are available, a YES/NO answer and a confidence rating.

2. Respondents are to use the YES/NO option to indicate whether they would bring their child's immunization records in the situation given.

3. If respondents answer YES to an item, they are to indicate how confident they are that they would bring their child's immunization record in the situation described, by selecting a number from the following confidence scale:

Confidence Scale

10	20	30	40	50	60	70	80	90	100
Very Uncertain				Somewhat Certain					Very Certain

SCORING AND INTERPRETATION

1. The rationale underlying this measure is that the more often respondents indicate that they would, with a high degree of confidence, bring their child's immunization records, the stronger the intention of those respondents to bring their child's immunization records.

2. This inventory can be scored in several ways, two of which are described here. In the first procedure, the number of YES responses is used as a gross index of individuals' intentions to bring their child's immunization records. The more YES responses, the more situations in which individuals believe that they would bring their children's immunization records.

   A combined analysis of YES/NO responses and confidence ratings allows for a more complete assessment of program effectiveness, as it incorporates both sources of information in a single index. This analysis is accomplished by computing the mean strength of the rated intention across all items, that is, by dividing the sum of the confidence ratings made in conjunction with "YES" responses by the number of items in the questionnaire. High scores reflect a strong intention to bring children's immunization records across a variety of settings, along with a high level of confidence in that intention.

MEASURE FORMAT

1. The following plan indicates the key characteristics of the "Bringing Records for Your Child" inventory developed from these test specifications.

Item	Potential Barrier
1	Being rushed before going to the doctor
2	Difficulty in locating immunization records
3	Lack of perceived responsibility for record keeping
4	Lack of perceived need for immunization records
5	Difficulty in locating immunization records
6	Being rushed before going to the doctor
7	Lack of perceived responsibility for record keeping
8	Lack of perceived need for immunization records

TEST SPECIFICATIONS

MY BODY

GENERAL DESCRIPTION

This measure is designed to assess children's respect for their bodies. Children are asked to indicate whether they would engage in activities which are healthful and avoid activities which are harmful to the body.

SAMPLE ITEM

Read each question. Then put a check (√) under the answer that best tells what you are willing to do to take care of your body.

In order to take care of your body, are you willing to ...	CERTAINLY YES	PROBABLY YES	MAYBE	PROBABLY NOT	CERTAINLY NOT
1. ... exercise several times each week?	___	___	___	___	___

STIMULUS ATTRIBUTES

1. An item will specify a healthful activity or the avoidance of a harmful activity. Individuals are to indicate if they would be willing to take care of their bodies even if it means engaging in the healthful activity or avoiding the harmful activity.

2. The activities presented in the test items will be important to maintaining healthy bodies. These activities will include exercising; getting adequate rest; avoiding cigarettes, alcohol, and unnecessary drugs; following doctor's orders; seeing a doctor regularly; obtaining immunizations; eating properly; and avoiding unnecessary stress.

3. Each item will be 10 words or less in length. The words used will not exceed the fourth grade level on the IOX Basic Skills Word List, except for the following words: alcohol, cigarettes, diseases, immunizations.

RESPONSE ATTRIBUTES

1. The following five response options will be available for each item: CERTAINLY YES, PROBABLY YES, MAYBE, PROBABLY NOT, and CERTAINLY NOT.

2. Children are to use the response options to indicate their willingness to take care of their bodies in the specified manner. Respondents are to place a check in the appropriate space to the right of each item.

SCORING AND INTERPRETATION

1. The rationale underlying this measure is that the more often children indicate that they are willing, with certainty, to take care of their bodies even if it means engaging in healthful activities or avoiding harmful ones, the stronger their respect for their bodies.

2. Point values are assigned to items according to the certainty of the children in being willing to take care of their bodies, as follows: CERTAINLY YES = 5 points, PROBABLY YES = 4 points, MAYBE = 3 points, PROBABLY NOT = 2 points, CERTAINLY NOT = 1 point.

3. High scores indicate a strong respect for one's body, as evidenced by a willingness to engage in activities which are healthful and to avoid those which are not.

ANNOTATED EVALUATION BIBLIOGRAPHY

(1) American Psychological Association. Ethical principles in the conduct of research with human participants. Washington, D.C.: Author, 1973.

This treatise focuses on the appropriateness of carrying out various types of research investigations with human subjects. Because the American Psychological Association has had a long-standing concern about ethical issues in the conduct of research investigations, this publication will be of interest to numerous evaluators of health education programs.

(2) American Psychological Association, American Educational Research Association, National Council on Measurement in Education. Standards for educational and psychological tests. Washington, D.C.: Author, 1974.

This soon-to-be-revised volume presents the most widely used set of standards for psychological and educational tests. Frequently cited by users of educational tests, the standards have recently been employed in numerous judicial deliberations. Relatively brief, the standards should be consulted by health educators who employ assessment devices regularly.

(3) Anderson, L.W. Assessing affective characteristics in the schools. Boston: Allyn and Bacon, 1981.

Anderson provides an excellent set of practical suggestions for the creation of affective assessment instruments. He includes one of the most easily understood expositions of various scaling procedures including Likert, Thurstone, and Guttman scales.

(4) Berk, R.A. (Ed.). Criterion-referenced measurement: the state of the art. Baltimore: The Johns Hopkins University Press, 1980.

This collection of essays consists of papers presented at the first John Hopkins University National Symposium on Educational Research. The authors treat many of the important problems, both conceptual and technical, facing developers and users of criterion-referenced measures.

(5) Berk, R.A. (Ed.). Handbook of methods for detecting test bias. Baltimore: The Johns Hopkins University Press, 1982.

This collection of individual essays offers the reader an up-to-date depiction of methods currently available to detect the presence of bias in tests.

(6) Campbell, D.T., & Stanley, J.C. Experimental and quasi-experimental designs for research. Chicago: Rand McNally, 1966.

This volume, originally a chapter in a larger volume, has had substantial impact on the fields of research and evaluation. Evaluators of health education will wish to consider this truly classic treatment of data-gathering designs suitable for experimental and quasi-experimental settings.

(7) Churchill, G.A., Jr. Marketing research: methodological foundations (2nd ed.). Hinsdale, Ill: The Dryden Press, 1979.

Although written in the context of marketing research, this textbook covers several topics of vital importance in evaluation. Topics such as research design, data collection, sampling, and data analysis are covered in a readily understandable yet accurate way. An excellent resource.

(8) Cohen, J. Statistical power analysis for the behavioral sciences (Rev. ed.). New York: Academic Press, 1977.

Cohen offers a useful treatment of factors which should be considered when one draws samples for use in research or evaluation activities. Of special interest is the set of easy-to-use guidelines he offers for determining the estimated sample size necessary to detect differences between groups.

(9) Cook, T.D., & Campbell, D.T. Quasi-experimentation: design & analysis issues for field settings. Chicago: Rand McNally, 1979.

This widely cited volume provides a comprehensive treatment of quasi-experimental investigations in settings of substantial relevance to the concerns of health educators. There are excellent discussions included of internal and external validity, including the various threats to both types of validity. A systematic consideration of the commonly used data-gathering designs is offered, including an extended appraisal of interrupted time-series designs.

(10) Cook, T.D., & Campbell, D.T. The design and conduct of quasi-experiments and true experiments in field settings. In M.D. Dunnette (Ed.), Handbook of industrial and organizational psychology. Chicago: Rand McNally, 1976.

This is an updated version of the famous exposition of quasi-experimental and experimental data-gathering designs by Donald T. Campbell and Julian C. Stanley (see reference No. 6). An excellent discussion of four types of validity is featured in this essay.

(11) Cronbach, L.J. Course improvement through evaluation. Teachers College Record, May 1963, 64, 672-683.

An early piece, presenting the virtues of what would later be termed, "formative" evaluation. This article rings as true today as it did nearly two decades ago, and applies as much to evaluation in health education as it does to more traditional evaluation. Emphasizing the role of evaluation in gathering information which can improve programs, this article is well worth reading.

(12) Cronbach, L.J., and associates. Toward reform of program evaluation. San Francisco: Jossey-Bass, 1981.

A recent publication, this book considers the function of evaluation in a pluralistic society and presents 95 theses on the role of evaluators and evaluations. In addition to providing a contemporary conception of evaluation, it provides a historical and multidisciplinary perspective on the field. This volume will be of considerable interest to those evaluating health education programs.

(13) Cronbach, L.J., et al. Analysis of covariance in nonrandomized experiments: parameters affecting bias. Unpublished occasional paper, Stanford Evaluation Consortium, Stanford University, 1977.

A highly technical piece on the complications associated with using analysis of covariance, this article is recommended only for those prepared to handle a critical problem in a sophisticated way.

(14) Cronbach, L.J., & Furby, L. How should we measure 'change' - or should we? Psychological Bulletin, 1970, 74, 68-80.

A technical treatise on the dangers associated with using gain scores. A very significant piece, but recommended only for those with some psychometric training.

(15) Ebel, R.L. Essentials of educational measurement (3rd ed.). Englewood Cliffs, N.J.: Prentice-Hall, 1979.

This is a standard, easily read introductory text, covering important topics in the field of educational testing. Ebel, a prominent leader of traditional educational testing practices, provides a lucid treatment of a wide range of measurement topics.

(16) Green, L.W. Research methods translatable to the practice setting: from rigor to reality and back. In S. Cohen (Ed.) New directions in patient compliance. Lexington, Mass.: Lexington Books, 1979.

Green deals with a practical dilemma facing those who evaluate health education programs, namely, the necessity to make trade-offs between validity and feasibility in field settings. Six strategies for coping with evaluation under adverse circumstances are described.

(17) Green, L.W., & Figá-Talamanca, I. Suggested designs for evaluation of patient education programs. Health Education Monographs, September 1974, 2 (1).

In this essay Green and Figá-Talamanca suggest data-gathering designs for conducting evaluations of patient education programs. The authors also explore several issues related to evaluations of this variety.

(18) Hambleton, R.K., et al. Criterion-referenced testing and measurement: a review of technical issues and development. Review of Educational Research, Winter 1978, 48 (1), 1-48.

This is a comprehensive review of the field of criterion-referenced testing. Hambleton and his colleagues do a masterful job of isolating the key issues in criterion-referenced testing, then describing results of research investigations bearing on those issues. Somewhat technical at times, this review is one of the more widely cited essays dealing with criterion-referenced testing.

(19) Hays, W.L. Statistics for the social sciences (2nd ed.). New York: Holt, Rinehart, and Winston, 1973.

A comprehensive text dealing with basic and advanced statistical considerations. Somewhat technical at points, Hays nonetheless provides an excellent set of step-by-step guidelines to statistical practice.

(20) Hull, C., & Nie, N.H. Statistical packages for the social sciences (SPSS). New York: McGraw-Hill, 1978.

This is a widely used, well organized set of "canned" computer analysis programs for use in the social sciences. Health educators who have occasion to use computer analyses will find the SPSS manual most helpful.

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The development of these evaluation standards was spearheaded by a joint committee of the American Educational Research Association, the American Psychological Association, and the National Council on Measurement in Education. Thirty standards are presented, addressing issues related to deciding whether to evaluate, defining the evaluation problem, designing the evaluation, budgeting for the evaluation, collecting and analyzing data, and reporting the evaluation. Intended for both consumers of evaluation and individuals conducting evaluations, this reference may be of most use to evaluators who are relatively new to the field.

(22) Levin, H.M. Cost-effectiveness analysis in evaluation research. In M. Guttentag & E.L. Struening (Eds.), Handbook of evaluation research (Vol. 2). Beverly Hills, CA.: Sage, 1975.

This essay probes the important considerations involved in determining cost-effectiveness of programs in the context of educational evaluations. Theoretical as well as practical guidelines are provided.

(23) Linn, R.L., & Slinde, J.A. The determination of the significance of change between pre- and post-testing periods. Review of Educational Research, 1977, 47, 121-150.

This article reviews many of the major issues in the measurement of change from pretesting to posttesting periods and suggests possible alternatives. These authors share the general sentiment of many others in the field that, "more is expected from gain scores than they can reasonably be expected to provide."

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This collection of essays provides a series of useful suggestions for those who would become more sensitive to the possible bias presen[illegible] educational tests.

(26) Popham, W.J. Educational evalu[illegible]on. Englewood Cliffs, N.J.: Prentice-Hall, 1975.

This is an introductory text, written in fairly non-technical language, about the field of educational evaluation. Evaluators of health education programs will find it simple to translate the book's contents to their own specialties.

(27) Popham, W.J. Modern educational measurement. Englewood Cliffs, N.J.: Prentice-Hall, 1981.

This is an up-to-date treatment of varied topics in the field of educational measurement. Norm-referenced measurement and criterion-referenced measurement are both considered, with the special applications of criterion-referenced assessment emphasized. Chapters on the relationship of testing to teaching and the measurement of affect will be of special interest to health educators.

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This is an easily read introductory text dealing with the fundamental types of statistical considerations needed by program evaluators. It is intended for those who are not particularly comfortable with mathematical approaches to statistics.

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In this essay Scriven offers goal-free evaluation as an antidote to excessive preoccupation with the program staff's expressed objectives. Scriven argues that evaluators should attend to the results produced by a program, not the rhetoric of its program goals.

(32) Scriven, M. The methodology of evaluation. In R.E. Stake and others (Eds.), Perspectives on curriculum evaluation. Chicago: Rand McNally, 1967.

This seminal article was the first essay in which Scriven distinguished between the now commonly accepted formative and summative roles of evaluators. Scriven ranges over a wide variety of topics, emphasizing the importance of comparative appraisals of two or more programs' merits.

(33) Siegel, S. Nonparametric statistics for the behavioral sciences. New York: McGraw-Hill, 1956.

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In this volume, Suchman provides extensive coverage of the application of the experimental research model in conducting evaluations. Although evaluation has come a long way since this book was written, it provides a clear description of the predominant conceptualization of evaluation in the past decade.

(35) Tukey, J.W. Exploratory data analyses. Reading, Mass.: Addison-Wesley, 1977.

Creative approaches to displaying and understanding data are provided by Tukey in this excellent demystification of data analysis.

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This charming volume provides readers with a series of powerful and clever tactics to secure data, particularly of an affective nature, without sensitizing respondents to the evaluator's purposes.

(37) Weiss, C.H. Evaluation research: methods of assessing program effectiveness. Englewood Cliffs, N.J.: Prentice Hall, 1972.

Weiss offers a pithy overview of prominent program evaluation considerations including the formulation of questions to be addressed, the design of the evaluation study, and the utilization of evaluation results. A paperback, this brief book (160 pp.) offers an excellent introduction to what Weiss refers to as "evaluation research."

(38) Worthen, B.R., & Sanders, J.R. Educational evaluation: theory and practice. Worthington, Ohio: C.A. Jones, 1973.

This volume was one of the earliest compilations of various program evaluation models applied to education. Included in the evaluation theorists whose views are presented in this book are Stake, Cronbach, Scriven, Tyler and others. Worthen and Sanders have authored sections of the book and have included a series of original chapters by a number of evaluation specialists. While focused on educational evaluation in general, the volume is of substantial relevance to program evaluation of health education programs.

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This easily read essay describes the randomized response technique, a procedure used to obtain sensitive information from respondents more accurately than if respondents were directly asked about sensitive information.

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